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ANNUAL MEETING OF THE
BRITISH ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE

MAURICE GOLDSMITH

PREVIEW OF THE 117TH MEETING, AAAS

ANNUAL SCIENCE EXPOSITION

SCIENTIFIC BOOK REGISTER

NEWS AND NOTES



COMPLETE TABLE OF CONTENTS ON PAGE 3

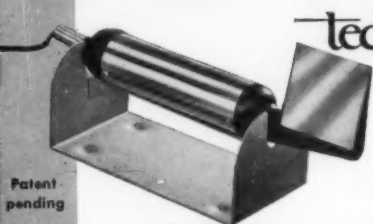
VOLUME 112, NUMBER 2919

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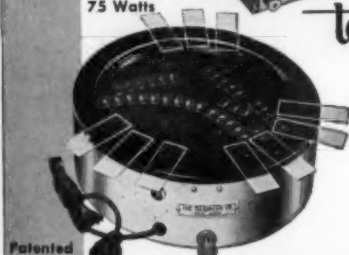


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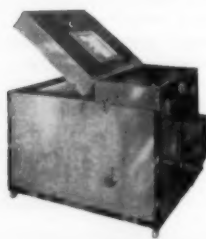
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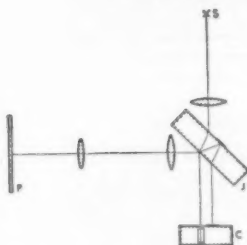


Fig. 1—Light from a source, *S*, is converted to parallel beams by means of a lens, then passed through interferometer plate, *J*, which produces a front and back beam. Beams are directed on cell, *C*, reflected there, superimposed by same plate, *J*, and returned through lenses to photographic plate, *P*.

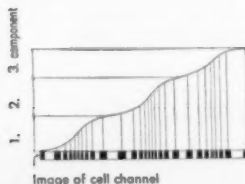


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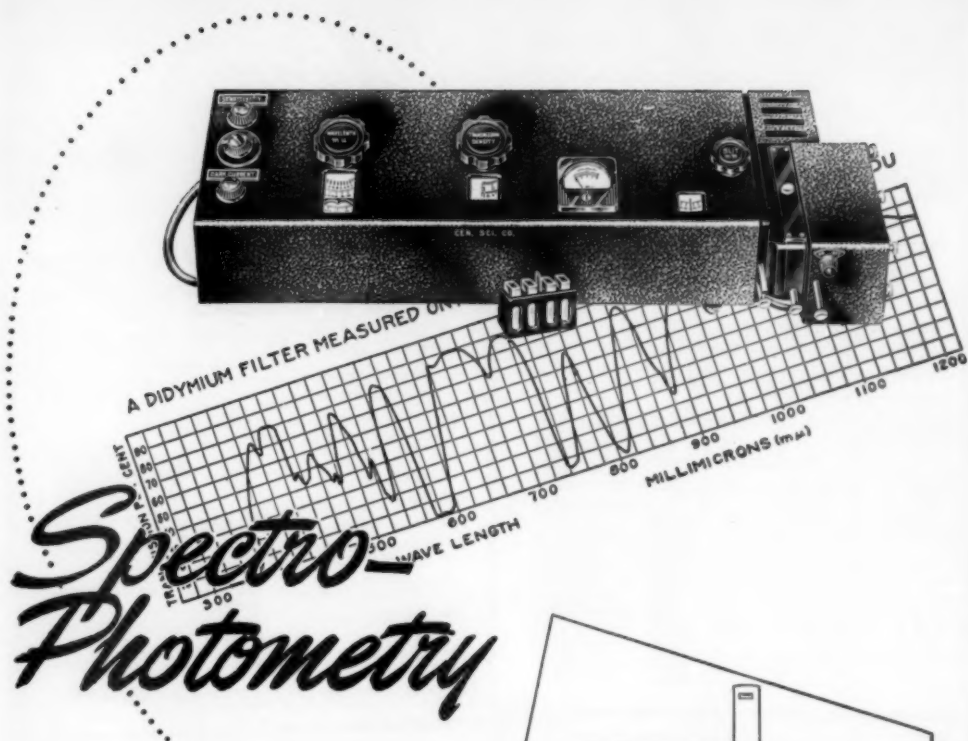
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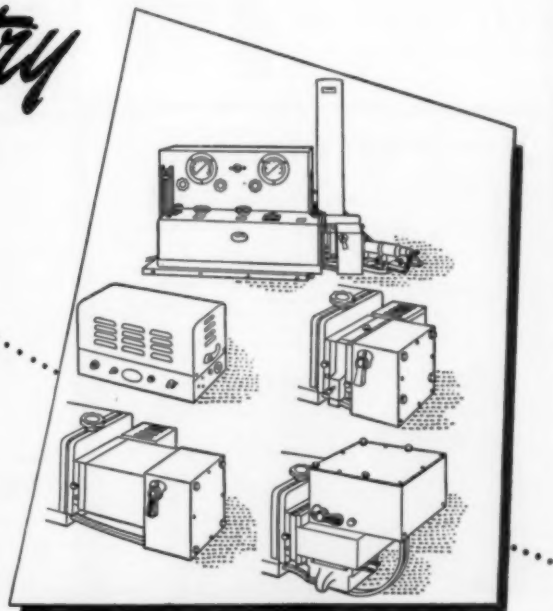
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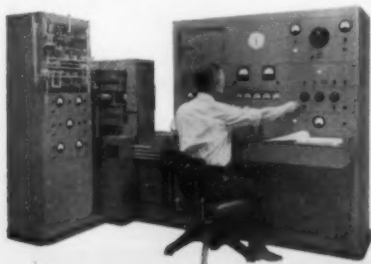


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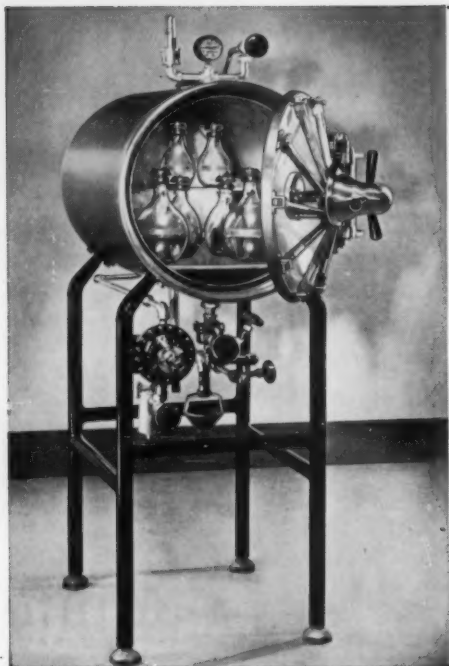
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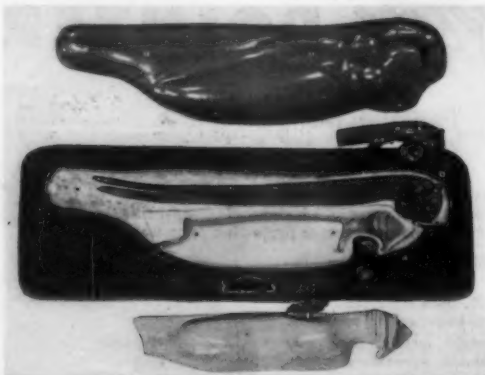
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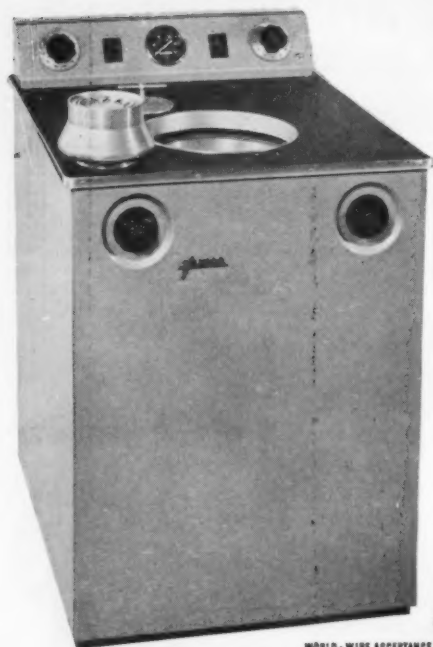


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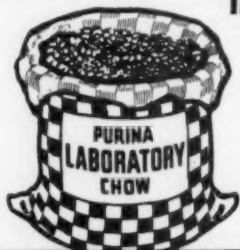


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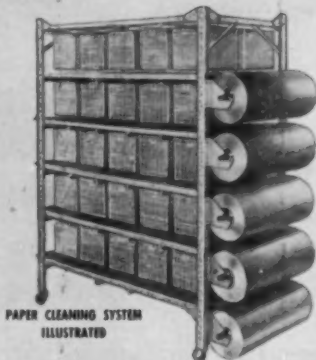
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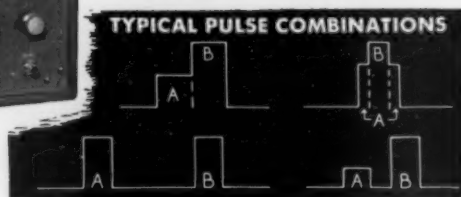
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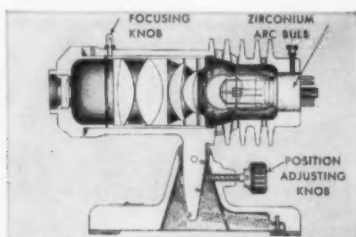
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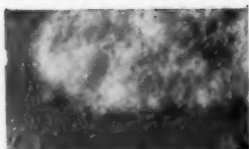
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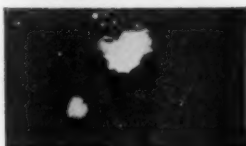
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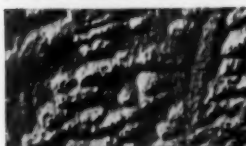
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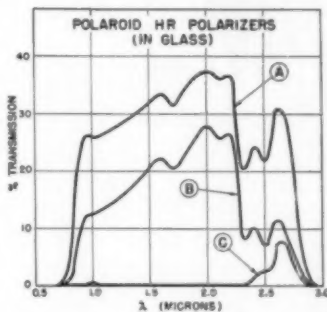
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Annual Meeting of the British Association for the Advancement of Science

Maurice Goldsmith

Natural Sciences Department, UNESCO, Paris, France

THE 112TH ANNUAL MEETING of the British Association for the Advancement of Science was held in Birmingham, England, August 30 to September 6, 1950. Some 3,700 members registered attendance at the meeting, and local firms and individuals contributed nearly £9,000 to a fund to meet the expenses of the occasion. The theme of the meeting was "Energy in the Service of Man," which was directly linked up with Unesco's discussion campaign on the same theme for 1950-51.

Sir Harold Hartley, in his presidential address, dealt with "Man's Use of Energy." He reminded us that it is only a century since man first studied the full import of the word "energy" and its significance as the driving force of all physical and chemical change and of life itself—what Clerk-Maxwell called "the go of things"; and yet it has been man's use of energy that has shaped so largely the material progress of the human race. Sir Harold's impressive survey began with "man's own needs, the energy by which life is sustained"; it examined man's progress in the art of living ("For a million years man was 'the servant of untamed Nature,' and only when he learned to tame her to his needs, to kindle fires and grow his food, did the social evolution, that made us what we are, begin. 'Man,' said Carlyle, 'is a Tool-using animal. Weak in himself and of small stature, he stands on a basis, at most of the flattest-soled, of some half square foot, insecurely enough. . . . Three quintals are a crushing load for him; the steer of the field tosses him aloft like a waste rag. Nevertheless he can use Tools, can devise Tools . . . without Tools he is nothing, with Tools he is all!'"); the industrial revolution; Watt's steam engine; the development of the laws of energy; and the period from 1850 to 1900 (when, "with the turbine and the high pressure boiler, the polyphase alternator with its rotating magnetic field, steam and electricity entered on a new age of power").

Thus we entered into the twentieth century, in which the world demands for more power have risen daily.

There is a limit to the capacity of the human stomach [Sir Harold continued], but none to man's appetite for energy as he finds new uses for it every day. [The broad outlines are]: The world's consumption of every kind of energy to-day, food for men and beasts, heat, light and power, needs a gross yearly intake equivalent to four thousand million tons of coal. On a thermal basis this demand is met by food from agriculture 20 per cent, by coal and lignite 41 per cent, by wood 6 per cent, by oil 25.5 per cent, by natural gas 6.5 per cent, by hydro-electricity 1 per cent. So that about 30 per cent comes from the current revenue of plant and animal growth and water power, and the remainder from the capital resources of coal and oil. Leaving aside the work equivalent of human and animal labour, and taking into account the efficiency with which the other energy sources are applied by man, their useful contributions to-day are, roughly, solid fuel 56 per cent, liquid and gaseous fuel 37 per cent, water power 7 per cent.

What of the future? Reserves of coal are ample; reserves of oil and natural gas are smaller and harder to define, but fresh fields are being found, and there is no need to fear a shortage for some decades. Before then synthetic oil from coal and the huge reserves of oil in shale will provide substitutes. Output from the world's reserves of water power, if developed, would go far toward supplying the total inanimate energy man is using today. But these reserves are scattered, and many lie in distant regions far from the crowded areas of the world. Like coal and oil, there is a most unequal distribution of resources between nations. The countries north of latitude 20° contain 94 per cent of the world's coal reserves and 83 per cent of the oil reserves, whereas those to the south contain two-thirds of the world's water power potential. The dependence of one country on another was shown in many ways. For example, reserves of phosphates and potash necessary for the growth of

food, as well as the metals for the machine age of today, are most unequally divided.

The global sufficiency of energy reserves is but a poor consolation for the countries that have few. The recent State Department Survey shows that half the world's visible reserves lie in the United States or the U.S.S.R., and another third in nine other countries. Of the remainder none can claim as much as one per cent, so that their long term development may call for new techniques. These inequalities are reflected in consumption to-day. At one end of the scale, the United States uses yearly the equivalent of 9 tons of coal per head, while at the other, India and China are using less than one-fifth of a ton per head. The figure for Britain is a little over 4 tons, of which one-third provides domestic needs of heat, warmth, and food, leaving nearly 3 tons for transport and industry.

Sir Harold then went on to examine the prospects of meeting future demands. In the four energy industries—coal, electricity, gas, and oil—the major advances have been made. The most modern types of plant have reached a point where only fractional progress is likely to be made, and where the limits might be the discovery of new alloys, or the higher cost which the gain in efficiency might not justify. Substantial savings can be made by raising the standard of all plants to that of the best practice. With the continuous increase in the demand for electric power and the heavy capital cost of generating equipment, the problem of the combined use of heat and power is of major importance. Inefficiency in the use of heat and power in industry, in transport, and in the home, for one reason or another, combines to make the over-all efficiency of use in Britain probably less than 15 per cent. Here is urgent need for large economies to save the coal that is needed for increased production.

In discussing future possibilities, Sir Harold made an important suggestion about transmission:

The unequal distribution of energy sources will make its transport of increasing importance in the future, and here the possibility of transmitting electric power over long distances by high-voltage direct current has passed the experimental stage and is waiting for development. By this means it should be possible to transmit large blocks of energy economically for perhaps a thousand miles by underground or submarine cable and thus link consuming centres with new and distant sources of hydro-electric power. There is, too, the interesting possibility of linking the British and European grids and thus securing a better balance between capacity and requirements by taking advantage of the seasonal variations in capacity and the diversity of demand. Such a scheme would, of course, be complementary to the distribution of power by alternating current, and it offers an opportunity for us to share in European co-operation without raising the delicate problems of supra-national authority. A link of 250,000 kw. capacity should be of mutual service to both

sides by providing the equivalent of a large modern generating station as stand-by plant.

He referred also to energy from the tides and from solar radiation, to increasing the efficiency of photosynthesis, and to the "fuel cell." ("Mayer ended his short prophetic paper in 1842 by saying that the inefficiency of the steam engine justified the attempt to produce 'motion' by other means than the sacrifice of carbon and oxygen, for instance by electricity obtained by chemical means. An economical fuel cell, in which the free energy of the oxidation of carbon is converted into electricity, has so far evaded discovery, but it remains one of the long-distance goals of research.")

So far as nuclear energy is concerned, Sir Harold said, it is clear that the difficulties to be overcome before the use of nuclear energy becomes economical are most formidable, and their solution will require intense effort over a long period. New engineering materials will have to be found with properties never before investigated or required. By-products and radiations of nuclear plants are so dangerous to life that their operation is possible only by automatic controls. The latest chapter in man's use of energy, the new science of automechanisms, seemingly offers a substitute for the human senses—with certain limitations. He reminded his audience that no automechanism has approached the delicate perception of the sensory organ with which his brother chemists are so well endowed. ("Their noses infinitely wise. Their minds being memories of smells.") In the future, he thought, one of the indexes of economic progress should be, not the energy used per worker, but the output of goods and services per horsepower employed.

Finally, he asked: "Have I claimed too much for progress—progress, that missing word among the Greeks? Have we replaced the 'Golden Age' by an Age of Steel? Has man's use of energy brought happiness or not?" Hope lies in man's new understanding of nature's processes, in his more efficient use of her resources, and in the growing recognition of the dependence of one nation upon another. Wendell Willkie saw this so clearly in his classic phrase "to raise the standard of living of one man anywhere in the world is to raise the standard of living by some degree of every man everywhere in the world." The natural wealth of the world, distributed in such an accidental way, can only be used to meet its ever-growing demands if there are inventories of world resources, so that each country may know the resources and potentialities of the rest.

Sir Harold ended: "In all these plans energy will play a vital part. So often its availability will dictate the pattern of development. It may well be the limit, in Bacon's words, 'to the effecting of all things possible.' Throughout the ages it has been the key

to progress and it has not lost its power. On man's wise use of energy depends so much the future of this troubled world."

Different aspects of energy were discussed in a number of sections. F. H. Garner, in a review of chemical energy, pointed out that most of the efficiencies attained in its utilization are extremely low. For industrial power and heat from coal the net over-all efficiency has been calculated at 17 per cent; that is, 83 per cent of coal burned is wasted. He emphasized the importance of liberating chemical energy for man's use in the most suitable form for each particular purpose, and referred to the possibility of converting chemical energy directly into electrical energy by means of a voltaic cell.

In the main building of Birmingham University, there was an exhibition illustrating "Energy in the Service of Man." One exhibit was of two recent attempts to design a fuel cell in which the free energy of fuel could be directly converted to electrical energy, as in a battery. The Russian fuel cell devised by O. K. Davtyan in 1947 was shown as a working model. It uses hydrogen as a fuel and operates at room temperature. The claim is that an output of 0.74 volts with a current of 0.01 amperes per square centimeter is obtained. It is believed that more than 30 per cent conversion of the normal fuel energy is realized. The other cell was designed by A. M. Adams, of the British Electricity Authority Research Laboratory. It used carbon as the anode and source of energy but required a molten electrolyte and an operating temperature of 1,150° C. Voltage and current were the same as in the Russian cell, but the over-all efficiency was only 2 per cent. As a result, further experiments aimed at the direct use of coal have been abandoned. The general view, however, is that long-term research on this basic problem is still desirable.

Sir John Cockcroft discussed the problems of, and prospects for, nuclear power development. He said: "Valuable experience in the problems of nuclear power development has been gained at Harwell during the last two years from the operation of the second pile (B.E.P.O.), which was designed to develop the equivalent of 6,000 kilowatts of heat energy. One of the problems is to contain the radioactivity developed in the uranium fuel element by sheathing the uranium with an impervious metal container. This has been successfully achieved, and there has not been any leakage of radioactivity from the 16,000 'canned slugs' in the pile." At the same time new metallurgical developments will allow the pile power to be increased to about 10,000 kilowatts. This will probably make it worth while to insert heat exchanges in the outflowing cooling air and to use the heat.

One possible line of nuclear power development may

be the invention of a reactor of the type of B.E.P.O. to operate at still higher temperatures. This would require the uranium fuel element to be sheathed by a metal that will withstand higher temperatures than aluminum without absorbing too many neutrons. Metallurgical development is, therefore, proceeding on the use of beryllium and zirconium.

Nuclear furnaces of this kind may be able to operate for 10-30 years without refueling. A power system based on such nuclear furnaces could only be supported by the extensive supply of uranium available in small concentrations in shales, granites, and other natural sources. The possibility of an economical system depends on the extraction of uranium from such ores at a reasonable cost. A mineral dressing and chemical engineering laboratory has been equipped at Harwell for such studies. Longer range studies are proceeding on breeder reactors to make more economical use of uranium, but their operation requires the solution of difficult chemical engineering problems. "It is obvious that nuclear power is in a very early development stage and that there are many formidable problems to be solved before it can be reached on any large scale. It seems likely that the first experimental pilot power producer will be operating within five years. We shall then gain the operating experience which is essential before worthwhile predictions on the future of nuclear power can be made."

Details of the latest discoveries in the production of very heavy unstable mesons in cosmic radiation were described by P. M. S. Blackett. He showed cloud chamber photographs of their disintegrations taken by Carl Andersen at Pasadena, and by the British research team in the observatory at the Pic du Midi. Professor Blackett explained that in Manchester in December 1946, D. G. Rochester and C. Butler got a "very peculiar photograph." There was a V-shaped trail of a kind they had not seen before. They waited for nine months before the V-sign reappeared. The effect then was even stranger. One trail passed through a lump of lead without being deflected. "It was as though a skier tearing down a slope had crashed into a tree and then had gone straight through a dense wood without another collision. Obviously, to do that the skier must have changed his substance. It meant that the particle had lost its electric charge and had become a 'ghost' particle." This phenomenon seemed to indicate the existence of two new particles of a mass of around 900 electron masses, which are spontaneously unstable. One is neutral and decays into two charged particles; the other is positive and decays into one positive and one neutral particle. The masses of the new particles have been estimated to be between 250 and 400 elec-

tron masses larger than the sum of the masses of the particles into which they decay. The new large mesons have been named "V-particles," and it is clear that the products of their disintegration are pi-mesons. The cloud chamber at Pic du Midi began to work last summer, and new photographs of V-particle disintegrations are now being obtained about once a week.

In the Physics Section, R. E. Peierls described the use of linear accelerators in the investigation of the structure of the atomic nucleus. He referred to the evidence of the existence of new and heavier mesons that could only be produced in the laboratory by the use of particles of much higher energy than at present available. D. W. Fry, of the Harwell Research Observatory, told how linear accelerators have been designed with energies of 4 and 10 million electron volts. They are considering the construction of an accelerator 100 meters long, which would give energies of 16 million electron volts.

The Physics, Engineering, and Psychological Sections had a joint meeting to discuss the presentation of technical information. R. O. Kapp, of London University, stressed the need for a new technique of good exposition. Reading, writing, listening, and talking are now among the most important tools of science. The efficiency of such tools must be no lower than that expected of a piece of laboratory equipment. A poor presentation of material leads to waste of time and ineffectual work. Good writing, logical and clear presentation, as well as knowledge of those being addressed and of the factors relative to memory and association of ideas, are the three aspects of this technique. Little research has been done in this field, but happily its existence has not gone unnoticed. Like other techniques, it needs special teaching in institutions. In the discussion, the director of a big British publishing firm said that, of 600 manuscripts received in the past ten years, only five could be sent to the printer without delay or query, and most involved lengthy correspondence with the authors.

The Education Section discussed the dissemination of scientific knowledge among nonscientists. Eric James, headmaster of Manchester Grammar School, spoke on science and the general education of the nonscientist, stating that attention is shifting from the need for a wider education for the scientist to the teaching of science to the Arts student, because of the impact of science on contemporary society and ideas. He favors general science education for upper form pupils, aimed at giving them a reasonable amount of factual knowledge drawn from a wide field and, through that, an understanding of the scientific method and of the relation of science to culture, society, and ideas. The notion that scientific method is applicable to all problems and that scientific truth

is the only truth must be guarded against, and the limitations and assumptions of the scientific method must be one element in the instruction.

W. E. Flood, of Birmingham University, described to the Psychological Section some investigations into the best way of presenting science to the general public. He found that both sexes are particularly interested in medicine, disease, and health. Male interests are new discoveries, science and industry, and future advances. Female interests are pure and applied biology and psychology. Astronomy came eighth in the list (out of 23 subjects), and neither sex was much interested in aeronautics, public use of science, or textbook fundamentals.

Philip Vernon, of London University, gave details of the first inquiry ever made, in collaboration with the British Broadcasting Corporation, to discover what listeners really learn from the radio. His general conclusion was: if you understand what the B.B.C. talks are all about then your intelligence is above the average. More than half of Britain's radio listeners are baffled by involved themes, difficult words, and overlong sentences. Comparative tests on a sample of 4,600 listeners showed that spoken words have no greater impact on most people than printed words.

Sir Stewart Smith, technical director of Imperial Chemical Industries, discussed the critical importance of higher technological education in relation to productivity. He compared the position in this country with that in the United States, where production has increased at the rate of 3 per cent a year since the turn of the century, in contrast to Great Britain, where the rate was only half that figure. The United States now has an over-all productivity of approximately two and one-half times the corresponding figures in Great Britain. There is one basic factor in which the two countries differ—the relative numbers of those trained in applied science. In the interwar period, the ratio of First degrees for men in all faculties in the United Kingdom remained at about 1.5 a year for over 10,000 of the population, but the figure for the United States increased from 4.7 to 8.0. That leads to the conclusion that, for a given level of fundamental scientific knowledge, the chief influence on the long-term trend of productivity is the rate at which applied scientists are trained and used in industry. At present, Britain's pure science is out of balance with applied science, which means that we are really presenting things to other people to develop. The solution lies largely in the hands of the schoolmasters and the academic staffs at the universities, who can do much to influence the right sort of pupil to take up applied science.

Redcliffe N. Salaman, in his presidential address to the Anthropological Section, spoke on "The Influence

of Food Plants on Social Structure." He illustrated his thesis with the potato, although he believes that as rich, and possibly more satisfying, a harvest awaits students who investigate the social repercussions of rice or maize. There is a great future for this research into human ecology. He showed that an easily grown, cheaply produced, substantial, efficient, and pleasant-tasting food may, under certain political and economic conditions, fatally menace the social well-being of the people who adopt it. When, in the past, the poor have had to rely upon the potato as their staple food, this automatically prevented a rise in wages, and their standard of life was kept at a low level. The potato economy not only depressed the standard of life to an irreducible minimum in Ireland; it went a long way toward shaping the life of the people. In fact, "the political and economic degradation of the Irish people has been intentional, and the use of the potato made it absolute."

E. H. Neville, in his presidential address to the Mathematical Section, discussed the complexities of mathematical notation. He thought the whole history of mathematics is fit gossip for a school of scandal. This is notorious in geometry; for example, no one ever pretended that Euclid succeeded in defining a straight line. It is equally true in the other great divisions of the subject. That two apples and two more apples compose four apples was plain enough; there is evidence to prove arithmetic, but an abstract "two"—two apples with the pomaceousness removed—never existed and never can exist. This "two" was not merely a fiction, but an inconceivable fiction. The most irritating of notational misfortunes are those where mathematicians would all like a slight modification in a usage that has become classical. The one thing we must not do is to use π with a new meaning.

Discussing the secular changes in the earth's magnetic field, S. K. Runcorn, of Cambridge, said that the conclusion of seismologists that the earth may have a liquid core has provided the essential clue. The origin of the secular change cannot be located in the solid mantle of the earth, where appreciable changes occur only over geological time. Motions in a liquid core can be assumed to be taking place, even though the details of the processes by which they alter the field are not at present understood. In particular, the remarkable westerly drift of the points of most rapid change of the geomagnetic field, which may be traced back to 1500, and which proceeds at a rate of 0.5 degrees longitude yearly, seems hard to interpret unless it is connected with a fluid motion. These motions seem to be of the order of 0.01 centimeters a second, and their origin may be of a dynamical or thermal nature. Thermal convection would occur if the core is homogeneous, and if the temperature gra-

dient exceeds about 0.5° C per kilometer. This flow of heat is calculated to be about one-eighth of the heat flowing out through the crust, which is supposed to be due mainly to the radioactivity of its upper layers. The source of heat in the core is also assumed to be radioactive decay.

R. J. Brocklehurst, as president of the Physiological Section, dealt with the hormones of the digestive tract—a group he described as an independent system that, unlike the endocrine group, is strictly localized in action. Perhaps the most striking feature of these mechanisms of the digestive tract is their independence of the nervous system. Each mechanism is brought into play when needed by a particular event in the sequence of digestive processes. Investigation of the actual cells of origin of each has barely begun, but their study has already revealed the fascinating nature of the chemical methods of coordination that are at work in the digestive system.

Modern trends in the classification of plants were discussed by E. E. Turrill, in his presidential address to the Botany Section. Up to quite recently, in most universities, taxonomy has been, at best, relegated to the position of Cinderella. However, it is now coming back into its own along modern lines, and younger students need have no fear that, if they become taxonomists, they will be specializing in an out-of-date subject with only artificial interest. Nevertheless, the satisfactory taxonomist is born, not made, at least in the sense that he must have a certain number of innate qualities, including a methodical mind with a liking for bringing order out of chaos, and a keen aesthetic perception of the beauty of shape, color, and the relationship of parts. Those qualities, usually considered the peculiar attributes of the artist, allow an appreciation of curves and other outlines and of balance of organs, which aid comparison at every stage of taxonomic practices.

R. Birley, headmaster of Eton College, led a discussion in the Education Section on economic determinism and education. He said that belief in Communist determinism, in the sense that the ultimate explanation of all such human manifestations as political institutions, law and moral standards, art and religion, is to be found in man's economic development, was not the invention of the founder of Communism. Economic determinism in itself attaches no meaning to history, though Communist variations most certainly do. The real strength of Communism seems to depend on the fact that it restores a meaning to history. We have had to restore the ideal of social utility to humanist education, and to recognize the danger that an education which seeks to work through the medium of great ideas and great literature may easily become merely academic. The solution is to be

found only through a change in our methods of teaching—through the conception of a sense of social obligation and a social consciousness in the teacher.

A. Davies, of Exeter University, suggested that the discovery of America was made five years before Columbus reached it in 1492. It was probably made by Dualmo in a voyage from the Azores. The conviction of Columbus that he would reach land 750 leagues west of the Canaries, and certain falsifications in his record of the voyage, have for long been controversial issues. Professor Davies explained them on the basis of a previous Portuguese discovery of America, of which Columbus had knowledge through his brother Bartholomew, who was employed as a cartographer by King John of Portugal. Two Portuguese maps of 1502 were shown, which charted such distinctive features as Florida, Yucatan, and the Gulf of Mexico. Referring to Columbus' visit to Lisbon on his return voyage, in spite of the danger of arrest,

Professor Davies said that the interview with King John was to convince him by means of the false records that the land discovered was not that already discovered by the Portuguese. King John was willing to accept this claim because, knowing that a large landmass barred the western trade route to the Spice Islands, he wished to divert Spanish attention westward while Portugal was exploiting the recently discovered eastern route and establishing itself in the Spice Islands. This did, in fact, result in the agreement giving the western half of the world to Spain and the eastern half to Portugal, and by the time the Spaniards had circumnavigated South America and Magellan had reached the East Indies, the Portuguese were already well established.

The 1951 annual meeting of the British Association for the Advancement of Science is to be held in Edinburgh, with H.R.H. the Duke of Edinburgh as president.



Preview of the 117th Meeting, AAAS, Cleveland December 26-30, 1950

General Information

The 117th Meeting of the American Association for the Advancement of Science will be one of the best balanced in the history of the Association, now in its 103rd year. All 17 of the AAAS sections and subsections have programs of from three to thirteen sessions each; thus no principal field of science is unrepresented. Forty affiliated societies and other organizations are participating in this Sixth Cleveland Meeting of the Association—some with an annual meeting of many sessions, others with one or two essentially regional meetings, and still others as co-sponsors of sessions with a AAAS section. The sections have arranged twenty-two symposia; the AAAS Co-operative Committee on the Teaching of Science and Mathematics, one; and the Association, four other, more general symposia. The programs of the participating societies include a number of important symposia, panels, and seminars in addition to their sessions for contributed papers.

In the Annual Science Exposition, which fills the street-level Arena of the Public Auditorium, 104 organizations have exhibits in 154 booths. The latest products of leading publishers, instrument makers, manufacturers of all types of laboratory equipment, and the large scientific supply houses have been joined by other nationally prominent firms, which have technical exhibits. An artificial kidney, an electronic problem-solving "brain," one or more types of color television, an electron microscope, models of atomic piles, a revolutionary new loom for the

textile industry—these are but a few of the exhibits that make the outstanding Exposition.

The six different four-hour programs of the AAAS Science Theatre comprise 66 titles of the latest foreign and domestic scientific films—a great many of them in color, and nearly all several reels long. For those interested in visual education, these programs alone would require a total of twenty-four hours to see and would be worth many times the Association's low-priced Registration Fee, which also admits registrants to the AAAS Reception, the Biologists' Smoker, and the Annual Science Exposition.

The Sixth Cleveland Meeting will be a convenient one: The Public Auditorium, one of the best-designed convention halls in the country, is within two to eight blocks of the downtown hotels. Most of the sessions of the sections and a number of the special sessions will be held in the Auditorium, which also houses the Main Registration Desk, the Tours Booth, Information Center, and Visible Directory of Registrants, as well as the Annual Science Exposition and the Science Theatre. A good lunch concession will be operated. The sessions of the participating societies will be in the Hotels Statler, Hollenden, Carter, and Allerton; for one afternoon, two of the zoological societies will meet on the campus of Western Reserve University.

Hotel room accommodations are adequate, with reservations being handled by the experienced Housing Bureau of the Cleveland Convention and Visitors Bureau. The hotels have made their public space available without charge and, as in 1949 and preceding years, no partici-

pating society will be asked to contribute toward projection expenses.

The General Program, nearly 300 pages, has gone to press on schedule and is being sent to advance registrants by first-class mail. (It is now too late to accept further advance registrations; plan to register upon arrival, either at the Main Registration in the Auditorium or at the hotels.) Registration fees have remained at their previous low schedule of \$2.00 for members of the AAAS, for spouses of registrants, and for students; \$3.00 for others. Each person attending the Meeting should register as soon as possible: (1) to receive the General Program (which is also a directory of the sections); (2) to be admitted free to all events; (3) and to be a sustaining part of the 117th Meeting.

Admission to the Annual Science Exposition is either by complimentary admission tickets (which must be applied for) or by Badge. The following events are restricted to registrants: The AAAS Reception, the Biologists' Smoker, and the Science Theatre.

Reservations for hotel rooms may be made until almost the last day—please see the hotel reservation coupon in this issue. Telegrams or telephone calls are advisable after December 18. Those who do not make advance reservations and find accommodations exhausted at a particular hotel will be given help—either by the desk clerk or by the Association's Information Center.

Preconvention Announcements. In this Preconvention Issue, it is not feasible to repeat in detail the announcements on the 117th Meeting that have already appeared in *SCIENCE*. These include:

The personnel of the local committees (*SCIENCE*, June 2, pp. 613-614), and synopses of the programs, as follows:

- I—The Annual Science Exposition, with a classified list of exhibitors, October 27, pp. 509-10.
- II—The Programs in Mathematics, Physics, Astronomy, and Chemistry, November 3, pp. 544-46.
- III—The Programs in Biology and Medicine, November 10, pp. 568-72.
- IV—The Programs in Geology, Geography, Engineering, and the Social Sciences. November 17, pp. 603-06.
- V—The Programs in Anthropology, Psychology, Education, and the History and Philosophy of Science, November 24, pp. 631-34.

Completely new in this issue are the daily summary of events, list of tours, descriptions of the more than 100 exhibits, the programs of the Science Theatre, the Special Sessions, and the four general symposia sponsored by the Association.

The headquarters hotels are repeated for convenience; details of registration are now available. The General Program will of course be needed for complete details of titles of papers, authors, and their institutional connections; and for considerable data on the Association, its sections, and 218 affiliated and associated societies.

Hotel Headquarters

The Hotel Statler is the official Headquarters of the AAAS; it is where the Council of the Association will

meet and other business sessions will be held. The Press Rooms—for receipt of authors' abstracts and source of press releases—are located just off the Mezzanine and immediately across from the Grand Ballroom.

The Main Registration, the Information Center, the Service Office of the Annual Science Exposition, and the Office of the Assistant Administrative Secretary are in or near the lobby of the Public Auditorium; they are reached by the Lakeside Avenue Entrance.

The Annual Science Exposition fills the large, street-level Arena of the Public Auditorium; it, also, is reached by the Lakeside Avenue Entrance. It includes the International Photography-in-Science Salon. Admission is by Registration Badge or Complimentary Admission Ticket. A luncheon area is located in the corridor on the Sixth Street side.

The Visible Directory of Registrants is on the stage of the Public Auditorium. It can be reached through the Exposition or (when the Exposition is closed) through the corridor on the Sixth Street side.

The Science Theatre, with its almost continuous showing of the latest scientific films, is located in the Little Theater next to the Music Hall, in the southwest corner of the Public Auditorium. The entrance is through the Annual Science Exposition. (If the Exposition is closed—and the theatre is running—the St. Clair Avenue entrance will be open.) Admission is restricted to registrants.

Headquarters of the Sections of the AAAS and the Participating Societies. Hotel Statler (Euclid Ave. at E. 12th St.): AAAS; Press; Sections I, K, and Q; AAAS Cooperative Committee; Academy Conference; National Association of Biology Teachers; National Academy of Economics and Political Science, Pi Gamma Mu; American Dietetic Association; National Science Teachers Association; American Nature Study Society, National Association of Science Writers, Scientific Research Society of America, Sigma Delta Epsilon, Society of the Sigma Xi, United Chapters of Phi Beta Kappa.

Hotel Hollenden (Superior Ave. at E. 6th St.): Sections F, G, and N (including Subsections Nm, Nd, Np); American Society of Parasitologists, American Society of Protozoologists, American Society of Zoologists, Society of Systematic Zoology, Herpetologists League; American Microscopical Society, Ecological Society of America; Alpha Epsilon Delta, Premedical Honor Society, American Pharmaceutical Association, Scientific Section.

Hotel Carter (Prospect Ave. at E. 9th St.): Sections A, E, L, and O; Geological Society of America, National Geographic Society, National Speleological Society; Biometric Society, Eastern North American Region; History of Science Society, Philosophy of Science Association.

Hotel Allerton (1802 E. 13th St.): Sections B, C, D, H, and M; American Meteorological Society, Oak Ridge Institute of Nuclear Studies; Society for Applied Anthropology; Society for Research in Child Development; American Home Economics Association.

Hotel Auditorium (St. Clair Ave. at E. 6th St.): Particularly convenient for exhibitor personnel since the Public Auditorium is just across the street.

Hotel Olmsted (Superior Ave. at E. 9th St.).

Registration

Main Registration and Information Center. The Main Registration and the Information Center are located in the lobby of the Public Auditorium, immediately inside the Lakeside Avenue Entrance. These will be open daily, Tuesday, December 26, through Thursday, December 28, from 8 A.M. till 9 P.M. On Friday, December 29, because of the Biologists' Smoker, 9:30 P.M. till midnight, the hours for registration will be 8 A.M. till 11:30 P.M., to accommodate nonregistrants who wish to attend the Smoker. On Saturday, December 30, registration is from 8 A.M. till 5 P.M.

Badges and General Programs may also be obtained at the four supplementary registration desks, but the *Main Registration* is the only place to sign up for tours or to receive supplementary literature, broadcast tickets, and the like. *Advance Registrants*, who have received their programs and badges prior to the Meeting, are urged to visit the Main Registration, at any convenient time, to receive these items.

Supplementary Registration Desks. For the convenience of those attending the 117th Meeting, there are four supplementary registration desks in the hotels as follows:

Hotel Statler—		Open
Mezzanine at	December 26	Noon–9 P.M.
Head of Stairs	December 27	8 A.M.–8 P.M.
	December 28	8 A.M.–8 P.M.
Hotel Hollenden—		
Lobby	December 26	4 P.M.–9 P.M.
	December 27	8 A.M.–8 P.M.
	December 28	8 A.M.–6 P.M.
Hotel Carter—		
Lobby	December 27	8 A.M.–8 P.M.
	December 28	8 A.M.–6 P.M.
Hotel Allerton—		
Lobby	December 27	8 A.M.–8 P.M.
	December 28	8 A.M.–6 P.M.

Registration Fee. The registration fee is \$2.00 for members of the AAAS, for *bona fide* students, and for a wife or husband of a registrant; it is \$3.00 for all others. Each registrant receives a receipt, a Convention Badge, and the General Program—the only publication containing the programs of all 17 sections and of all participating societies.

Visible Directory of Registrants. The Visible Directory of Registrants is located on the Stage of the Public Auditorium at the south end of the exhibit area of the Annual Science Exposition. It will be open daily except from 11 P.M. to 8 A.M. During the hours the Annual Science Exposition is not open, the Visible Directory can be reached from the Sixth Street entrance. The registration cards of all registrants are placed in the Visible Directory as soon as possible after registration. The arrangement is alphabetical. The cards of advance registrants are *completely* alphabetized since they were posted in Washington prior to the meeting; all other registration cards are filed to the second letter of the surname (Ba, Be, etc.). Members of the Press, exhibitor personnel, and guests are included in the Visible Directory—on *blue* cards instead of yellow.

Mail, Telegrams, and Messages. Mail and telegrams addressed in care of the AAAS will be held at the AAAS Office off the lobby of the Public Auditorium. Every effort will be made to notify addressees listed in the Visible Directory but the Association assumes no responsibility for the delivery of mail or telegrams. Telephone and personal messages will be filed alphabetically in the AAAS Office.

Society Meal Function Tickets. In general, tickets to the dinners, luncheons, or breakfasts of any society are obtainable only from representatives of the society and during the preceding sessions of the society. Any society, however, has the privilege of the use of an AAAS Supplementary Registration desk in its headquarters hotel to serve as a ticket booth, provided that that portion is manned by a representative of the society.

Tours

An extensive series of tours and special arrangements for visitors at academic institutions, industrial laboratories, museums, and other points of interest have been provided for those attending the meeting. In many cases, advance registration—to close at noon the day before the tour—is necessary. In general, nearby points can be reached by local buses, trolleys, or taxis; for more distant locations, bus transportation will be available at special rates when the groups are of sufficient size.

TOURS BOOTH. For more detailed information on tours, for registration for tours, and for bus tickets, visit the Tours Booth, in the Lobby of the Cleveland Public Auditorium, together with the Information Center and the Main Registration.

TOURS THROUGH ORGANIZATIONS

- TOUR 1. *Aluminum Co. of America*
Wednesday, December 27, 1:30 P.M. Advance Registration required.
- TOUR 2. *American Gas Association*.
Friday, December 29, 10:00 A.M.
- TOUR 3. *Case Institute of Technology*.
Warner & Swasey Observatory of Case Institute.
Friday, December 29, 7:00 P.M. Advance Registration required.
- TOUR 4. *Cleveland Clinic*.
Cleveland Medical Library and Howard Dittrick Museum of Historical Medicine.
Western Reserve University.
Thursday, December 28, 9:30 A.M.
- TOUR 5. *Fenn College*.
Friday, December 29, 10:00 A.M.
- TOUR 6. *Ferro Enamel Corp*.
Thursday, December 28, 10:00 A.M.
- TOUR 7. *General Electric Lighting Institute*.
Tuesday, December 26, and Wednesday, December 27, 3:00 P.M. Advance registration (taken until 2 P.M. on Tuesday).
- TOUR 8. *The Glidden Co*.
Friday, December 29, 2:00 P.M.
- TOUR 9. *Harshaw Chemical Co*.

Friday, December 29, 10:00 A.M. Advance registration.

TOUR 10. National Advisory Committee for Aeronautics, Lewis Flight Propulsion Laboratory.

Thursday, December 28, and Friday, December 29, 2:00 P.M. Advance registration and proof of U. S. citizenship required.

TOUR 11. Standard Oil Co.

Wednesday, December 27, 10:00 A.M. and 3:00 P.M.

FIELD TRIP

Saturday, December 30, 9:00 A.M. All-day field trip through the Brecksville Reservation, sponsored by the American Nature Study Society, and the National Association of Biology Teachers. Luncheon at Science Club in Chagrin. Guests invited. Register by December 28 at the American Nature Study Society booth in lobby of Hotel Statler. Point of departure—Hotel Statler. Bus transportation—\$1.50; Luncheon—\$1.25.

MUSEUMS AND INSTITUTIONS

Museum of Art—11150 East Blvd. (Euclid Ave. car to East Blvd.) Daily at 9:00 A.M. to 5:00 P.M., Wednesday until 10:00 P.M., Sunday 1:00 P.M. to 6:00 P.M. Famous for its goldsmith work by Mayas and Incas, paintings by well-known artists.

Garden Center—11190 East Blvd. Located in Fine Arts Garden (Euclid Ave. car to East Blvd.). Daily 10:00 A.M. to 5:00 P.M., Sunday 2:00 P.M. to 6:00 P.M. Excellent garden library of many choice old books.

Health Museum—8911 Euclid (Euclid Ave. car to E. 89th St.). Daily 9:00 A.M. to 5:00 P.M. Wednesday until 10:00 P.M., with guided tour at 8:00 P.M.; Sunday 2:00 P.M. to 5:00 P.M. Exhibits relating to the human body. Transparent Woman.

Museum of Natural History—2717 Euclid (Euclid Ave. car to E. 24th or E. 30th). Tuesday and Wednesday, 9:00 A.M. to 5:00 P.M.; Thursday, Friday, and Saturday 9:00 A.M. to 10:00 P.M., with guided tours at 8:00 P.M.; Sunday 2:00 P.M. to 6:00 P.M. Primarily local specimens, dramatizing geology and ecology of this region and classification of animal forms. Outstanding attractions: the mastodon and *Dinichthys*.

Thompson Products Auto Album and Aviation Museum—E. 30th and Chester (Euclid Ave. car to E. 30th). Daily 1:00 P.M. to 5:00 P.M.; Wednesday and Friday evenings 7:00 P.M. to 10:00 P.M. Fine collection of antique automobiles and interesting early airplanes. Replica of the "Gay Nineties" Main Street.

Western Reserve Historical Society—10915 East Blvd. (Euclid Ave. car to East Blvd.). Daily 10:00 A.M. to 5:00 P.M.; Sunday 2:00 P.M. to 5:00 P.M. A treasure house of visual history containing dioramas of early Cleveland, etc.

The Howard Dittrick Medical Museum—11000 Euclid Ave. (Euclid Ave. car to Adelbert). Open to the public on Thursday afternoon. (See special Tour No. 4.)
Cleveland Public Library—325 Superior Ave. (One block east from Public Square). Through Friday,

9:00 A.M. to 9:30 P.M.; Saturday, 9:00 A.M. to 6:00 P.M.; Sunday, 2:30 P.M. to 6:00 P.M. (partial opening). 186,000 volumes on engineering and chemical technology; complete files of U. S. patents and specifications.

TWO-HOUR CULTURAL TOUR

Wednesday, December 27, 1:30 P.M. and Friday, December 29, 1:30 P.M. Conducted by Redifer Bus System (Gray Line Motor Tours, Inc.). Leave from Public Square side of Federal Building and end at same point. \$2.50 per person.

THREE-HOUR MUSEUM TOUR

Thursday, December 28, 1:30 P.M. Conducted by Redifer Bus System (Gray Line Motor Tours, Inc.). Leave from Public Square side of Federal Building and end at same point. Stops made at Western Reserve Historical Museum, Cleveland Art Museum, Cleveland Health Museum, and Cleveland Museum of Natural History. \$2.50 per person.

AAAS Business Sessions

The Council will meet Wednesday afternoon, December 27, at 4:00 P.M., and Friday morning, December 29, at 9:00 A.M., in the Pine Room, Hotel Statler. Among items of business to be considered are:

1. Election of a president-elect from nominees receiving the highest number of votes in the current runoff primary.
2. Election of vice presidents, from nominations currently being received from section committees.
3. Election of two members of the Executive Committee from nominations made by the present Executive Committee and by members of the Council. The two vacancies are created by the expiration of the terms of George A. Baitzell, who has served the regular 4-year term, and who has declined renomination; and of Paul Sears, who has served but one year, completing the unexpired term of President-elect Kirtley F. Mather.

4. Reports of officers and committees:

- a) Chairman of the Executive Committee
- b) Administrative Secretary
- c) Publications Committee
- d) Editorial Board
- e) Committee on Affiliation and Association
- f) Building Committee
- g) Cooperative Committee on the Teaching of Science
- h) Committee on the Evaluation of Scientific Merit

5. Revision of Constitution and Bylaws. The committee charged with this task is confronted with several basic questions that must be resolved by the Council before it can conclude its work. The committee is endeavoring to prepare a set of specific questions that can be distributed in advance of the meetings at Cleveland.

6. Future meetings of the Association.

There will be a Luncheon and Business Meeting of the officers of all AAAS sections Friday noon, December 29, in the Tavern Room, Hotel Statler. HOWARD A. MEYERHOFF and RAYMOND L. TAYLOR, Co-Chairmen.

AAAS Awards

The twenty-third award of the American Association for the Advancement of Science **Thousand Dollar Prize** will be made at the Cleveland Meeting to the author of a noteworthy paper presented on a regular program of the meeting and representing an outstanding contribution to science. The donor of this award, which is administered by the Association, has expressed the wish that the prize be awarded to a young scientist and that it shall not be divided among two or more scientists working independently or in collaboration. The prize is awarded upon the recommendation of a special Prize Committee, whose judgment shall be final. The winner at the New York Meeting in 1949 was Armin C. Braun; his paper was read before a session of the American Phytopathological Society, an affiliated society in Section G—Botanical Sciences.

The Prize Committee for the Cleveland meeting consists of JOHN R. DUNNING, Columbia University, *Chairman*; KENNETH K. LANDES, University of Michigan; BERNARD S. MEYER, Ohio State University; M. T. GOEBEL, E. I. du Pont de Nemours & Co.; and C. W. METZ, University of Pennsylvania.

It is virtually impossible to determine the relative merits of scientific contributions in wholly different fields, and, of course, not an easy task to single out contributions in any one field of science. The members of each year's Prize Committee must set their own standards for the evaluation of scientific work presented at an annual meeting of the Association. The secretaries of the sections of the AAAS and also of the societies participating are invited to assist the Prize Committee by their preliminary suggestions of one or more papers from the fields they represent for consideration by the Prize Committee.

It is not necessary that the prize winner be a member of the Association. All papers listed in the General Program, *except presidential and vice-presidential addresses and invited papers*, are eligible for the A.A.A.S. Thousand Dollar Prize.

AAAS-George Westinghouse Science Writing Awards

As a means of honoring those writers who undertake the serious task of bringing science into familiar reality for the layman, the Westinghouse Educational Foundation and the American Association for the Advancement of Science have annually sponsored, since 1946, the AAAS-George Westinghouse Science Writing Awards.

Awards of \$1,000 each will go to the writers of what the judges consider the best news story and the best magazine article on science published during the 1950 contest year in a newspaper and in a nontechnical, general-circulation magazine. Both awards will be presented during the Annual Meeting of the AAAS in Cleveland.

The judges, chosen to represent the general public, science, newspapers, and magazines, are: Henry R. Aldrich, secretary, Geological Society of America; Norman Cousins, editor, *Saturday Review of Literature*; Rudolph Fleesch, readability consultant; Hillier Kriehbaum, Department of Journalism, New York University; Detlev W. Bronk, President, The Johns Hopkins Uni-

versity, and President, National Academy of Sciences; Charles C. Hemenway, editor, the *Hartford (Conn.) Times*; John R. Dunning, Dean of the Faculty of Engineering, Columbia University; Howard A. Meyerhoff, Chairman, Managing Committee for the Awards, and Administrative Secretary of the AAAS; and Morris Meister, Principal of the Bronx (N. Y.) High School of Science and past-president of the National Science Teachers Association. Dr. Meister is chairman of the board of judges for the contest.

Winners in 1949 were Lester Grant, New York *Herald Tribune*, for newspapers, and George W. Gray, free-lance writer, for magazines.

Presentation of the 1950 Awards will be made at a luncheon in the Grand Ballroom of the Hotel Statler on Thursday, December 28. Dr. Roger Adams, President of the AAAS, will be the guest speaker. *Admission is by invitation only.*

Annual International Photography-in-Science Salon on Exhibition in the Annual Science Exposition in the Cleveland Auditorium

Prize-winning and other photographs entered in the Fourth Annual International Photography-in-Science Salon, sponsored by THE SCIENTIFIC MONTHLY and the Smithsonian Institution, are displayed in the Exposition area before going on a tour of important museums and scientific institutions about the country. They will be shown at the U. S. National Museum, January 3-31, 1951. Established in 1947 to encourage and extend the use of photography as a scientific tool, the contest has aroused wide interest, and photographs from it have been reproduced in scientific journals all over the world. Any scientist actively engaged in research (including photographic), teaching, private practice, or consulting work is eligible to enter this annual competition. All photographs must be taken for scientific purposes. They are judged by a panel of judges chosen to represent photography and the various sciences, particularly those making extensive use of photography in research.

Dates for showing the 1950 Salon may be arranged by writing to the Editor, THE SCIENTIFIC MONTHLY.

AAAS Special Sessions

One of the characteristic features of the Annual Meetings of the Association is the series of general lectures and addresses by outstanding authorities. Unless otherwise stated, these special sessions are open to the general public of the city in which the meeting is held. The special events sponsored by organizations that meet regularly with the AAAS are considered joint sessions with the Association.

1. THE AAAS PRESIDENTIAL ADDRESS. Thursday Evening, December 28; Grand Ballroom, Hotel Statler; at 8:00 P.M. The AAAS Presidential Address will be delivered by the Retiring President, ELVIN C. STAKMAN, Chief of the Division of Plant Pathology and Botany in the University of Minnesota, and ninety-ninth president of the American Association for the Advancement of Science.

His subject will be: "Science and Human Affairs."

ROGER ADAMS, President of the Association, will preside. Among those to be introduced and who will speak briefly are CHARLES J. STILWELL, President of the Warner & Swasey Company, General Chairman of the Sixth Cleveland Meeting, and THE HONORABLE THOMAS BURKE, Mayor of the City of Cleveland.

All registrants and all members of local committees are cordially invited to attend THE PRESIDENTIAL RECEPTION that follows the Presidential Address. It will occupy all the rooms and foyers on the ballroom floor of the Hotel Statler. The receiving line will be in the Euclid Ballroom.

2. THE ACADEMY CONFERENCE. Saturday Evening, December 30; Grand Ballroom, Hotel Statler; 8:00 P.M. This year, the evening address of the Academy Conference is open to all. The speaker is H. J. FULLER, Department of Botany, University of Illinois, who has been invited by the AAAS to repeat the address he gave as retiring president of the University of Illinois Chapter of Phi Beta Kappa. The title: "The Emperor's New Clothes, or *Prius Dementat*."

3. THE NATIONAL GEOGRAPHIC SOCIETY ANNUAL LECTURE. Wednesday Evening, December 27; Music Hall, Public Auditorium; 8:15 P.M. The speaker this year is MATTHEW W. STIRLING, director of the Bureau of American Ethnology, Smithsonian Institution, who recently led an expedition to Panama that was sponsored jointly by the National Geographic Society and the Smithsonian Institution. The lecture, "An Archeological Expedition to Panama," and accompanying sound film in color, will include both the scientific aspects of the expedition and human interest accounts of the customs of the little-known people of this area. MRS. STIRLING will contribute remarks.

On the platform to introduce the speakers will be KIRTLEY F. MATHER, President-elect of the American Association for the Advancement of Science, and LEONARD C. ROY, Chief of School Service, National Geographic Society.

4. THE SCIENTIFIC RESEARCH SOCIETY OF AMERICA in a joint program with SECTION M-ENGINEERING. Friday evening, December 29; Ballroom, Hotel Allerton; 7:30 P.M. The Second Annual RESA Lecture will be the third part of Section M's Symposium on "The Partnership of Science and Engineering in Research." The speaker will be EGER VAUGHAN MURPHEE, president and director of the Standard Oil Development Company. GEORGE A. STETSON, Chairman of the Society, will preside.

5. THE SOCIETY OF THE SIGMA XI. Wednesday Evening, December 27; Ballroom, Cleveland Public Auditorium, at 8:00 P.M. The Sigma XI Lecturer is RALPH W. G. WYCKOFF, Scientist Director, Laboratory of Physical Biology, Experimental Biology and Medicine Institute, National Institutes of Health. His subject: "The Macromolecular Texture of Biological Materials." Among the electron micrographs shown and discussed will be muscle, connective, and nervous tissue cells; dividing cells; and plant and animal cells infected with a variety of viruses, e.g., tobacco mosaic and influenza.

6. THE UNITED CHAPTERS OF PHI BETA KAPPA. Friday Evening, December 29; Grand Ballroom, Hotel Statler; 8:30 P.M. Since 1935 the United Chapters of Phi Beta Kappa has sponsored a lecture at the annual meetings of the American Association for the Advancement of Science, to emphasize the interdependence of the arts and the sciences in a free society. The 1950 lecture will be the eleventh in the series. The speaker is DETLEV W. BRONK, president of The Johns Hopkins University and president of the National Academy of Sciences. The title of his address: "Science and the National Welfare."

The presiding officer will be RAYMOND WALTERS, president of the University of Cincinnati. All members of Phi Beta Kappa and those attending the 117th Meeting of the Association are cordially invited to attend.

AAAS Symposia

1. SCIENCE AND INTERNATIONAL UNDERSTANDING. Two sessions. Arranged by BROOKS EMENTY, Foreign Policy Association, and E. C. STAKMAN.

Session 1. 2:30 P.M. Tuesday Afternoon, December 26; Ballroom, Cleveland Public Auditorium; E. C. STAKMAN, Retiring President, AAAS, presiding.

1. Mineral Resources and International Understanding. KIRTLEY F. MATHER, Harvard University, President-elect, AAAS, and HOWARD A. MEYERHOFF, Administrative Secretary, AAAS.

2. Biological Resources as a Factor in International Understanding. KARL SAX, Arnold Arboretum.

3. Intellectual Resources in International Understanding. W. ALBERT NOYES, Jr., University of Rochester.

Session 2. 8:00 P.M. Tuesday evening, December 26; Ballroom, Cleveland Public Auditorium. BROOKS EMENTY presiding. Speaker: LOUIS N. RIDENOUR, Department of Defense and University of Illinois.

2. SCIENCE AND HUMAN VALUES. Two sessions. Sponsored by the AAAS and the Committees on Endowment and Human Ecology, Ecological Society of America. Arranged by a committee consisting of CHARLES C. ADAMS, Ecological Society of America; GEORGE F. CARTER, The Johns Hopkins University; EDUARD C. LINDEMAN, Columbia University; MARGARET SNYDER, Educational Director, Mental Hygiene, Commonwealth of Virginia; and JOHN P. SHEA, Chairman, Committee on Human Ecology for the Ecological Society of America, Chairman.

Session 1. Scientific Perspectives. 9:30 A.M., Wednesday morning, December 27; Ballroom, Cleveland Public Auditorium. EDUARD C. LINDEMAN presiding. Honorary Chairman: ROGER ADAMS, President, American Association for the Advancement of Science.

1. Human Ecology: A New Source of Perspective. PAUL B. SEARS, Yale University.

2. Human Values and Group Dynamics: The Need for Multi-Discipline Research. RENSIS LIKERT, University of Michigan.

3. An Analysis of the Ecological Approach to Public Health Problems in War and Peace. JOHN E. GORDON, Harvard Medical School.

4. A Proposed Program of Research Designed to Facilitate the Advance of Human Ecology. MARSTON BATES, Rockefeller Foundation.

Session 2. Social Perspectives. 2:00 P.M. Wednesday afternoon, December 27; Ballroom, Cleveland Public Auditorium. EDUARD C. LINDEMAN presiding. Honorary Chairman: H. L. KEENEYSIDE, United Nations Technical Assistance Administration.

1. Democracy and Science: A Philosophical View. JOHN DEWEY, Columbia University. (Paper to be read by presiding officer.)

2. Education by Democratic Processes. M. L. WILSON, U. S. Department of Agriculture.

3. Science, Politics, and International Tension. OTTO KLINEBERG, Columbia University.

4. Science, Welfare, and Mental Health. GEORGE F. DAVIDSON, Ministry of Health and National Welfare, Ottawa, Canada.

5. Ecological Research in Relation to Programs of Technical Assistance. JEAN-PAUL HARROY, International Union for the Protection of Nature, Brussels, Belgium.

3. BOOKS, CIVILIZATION, AND SCIENCE.

Arranged by THEODORE WALLER, American Book Publishers Council, and others. 9:00 A.M., Wednesday morning, December 27; Ohio Room, Hotel Statler.

A panel discussion between scientists and science writers, and book publishers. The publishers will be represented by HUGH J. KELLY, McGraw-Hill Book Company, Inc.; GEORGE P. BRETT, The Macmillan Company; HERBERT S. BAILEY, JR., Princeton University Press; EDWARD M. CRANE, D. Van Nostrand Company. Speaking for science will be KIRTLEY F. MATHER, Harvard University; JAMES STOKLEY, General Electric Research Laboratory; RALPH W. GERARD, University of Chicago; and DAVID DIETZ, Scripps-Howard Newspapers and *The Cleveland Press*. WARREN GUTHRIE, Western Reserve University, *Moderator*.

4. Panel: EFFECTS OF GOVERNMENT SUPPORT ON SCIENTIFIC RESEARCH.

Arranged by DAEL L. WOLFLE, Commission on Human Resources and Advanced Training, National Research Council. (A part of the program of the Academy Conference.) 2:30 P.M., Saturday afternoon, December 30; Grand Ballroom, Hotel Statler. DAEL L. WOLFLE presiding.

1. ERIC A. WALKER, Research and Development Board, Department of Defense.

2. L. R. HAFSTAD, U. S. Atomic Energy Commission, Interdepartmental Committee on Scientific Research and Development.

3. DETLEV W. BRONK, The Johns Hopkins University, National Academy of Sciences, and National Science Foundation.

SUMMARY OF EVENTS

Tuesday, December 26

Registration: *Main Registration*, 8:00 A.M.-9:00 P.M.; *Hotel Statler*, 12:00-9:00 P.M.; *Hotel Hollenden*, 4:00 P.M.-9:00 P.M. The AAAS Annual Science Exposition opens at noon, closes at 5:00 P.M., reopens at 7:00 P.M., closes at 9:00 P.M. The AAAS Science Theatre, in the Little Theatre of the Public Auditorium has two programs: 1:30 P.M.-5:30 P.M., and 7:00 P.M.-11:00 P.M. *Open only to registrants.*

Chemistry

C Section on Chemistry—Tours to laboratories and industries of interest to chemists, all day.

Tuesday Morning

Astronomy

D Section on Astronomy—9:30 A.M.; Contributed Papers; Club Room C, Public Auditorium.

Tuesday Afternoon

AAAS as a Whole

2:30 P.M.; Symposium: Science and International Understanding, Session I; Ballroom, Public Auditorium.

Astronomy

D Section on Astronomy—1:30 P.M.; Contributed Papers; Club Room C, Public Auditorium.

Engineering

M Section on Engineering—2:30 P.M.; Annual Meeting of Section M Committee; Parlor C, Allerton.

Education

Q Section on Education—2:00 P.M.; Concurrent Session A, Panel: Visual Performance as Applied by Industrial and Educational Management; Parlor C, Statler. 2:00 P.M.; Concurrent Session B; Parlor E, Statler.

Tuesday Evening

AAAS as a Whole

8:00 P.M.; Symposium: Science and International Understanding, Session II; Ballroom, Public Auditorium.

Astronomy

D Section on Astronomy—8:30 P.M.; Address of the Retiring Vice President of Section D: Stellar Explorations with a Spectrograph; Club Room B, Public Auditorium.

Engineering

M and M1 Section on Engineering and the Cleveland Section of the American Society of Mechanical Engineers—8:00 P.M.; Joint Session; South Hall C, Public Auditorium.

Wednesday, December 27

Wednesday Morning

AAAS as a Whole

9:00 A.M.; Symposium: Books, Civilization, and Science; Ohio Room, Statler.

9:30 A.M.; Symposium: Science and Human Values, Session I; Ballroom, Public Auditorium.

Joint Presentation of Plans for Future Meetings of AAAS and of AIBS—9:00 A.M.; Cypress Room, Hollenden.

Mathematics

A and FG2 Section on Mathematics and Biometric Society, Eastern North American Region—9:00 A.M.; Joint Symposium: Mathematical Biology and Biometry, Part I; Grand Ballroom, Carter.

Physics

B Section on Physics—10:00 A.M.; Symposium: Fifty Years of Quantum Theory; Club Room B, Public Auditorium.

Astronomy

D *Section on Astronomy*—9:30 A.M.; Inspection of Warner & Swasey Observatory, Taylor and Brunswick Roads, East Cleveland.

Geology and Geography

E and E1 *Section on Geology and Geography and the Geological Society of America*—9:00 A.M.; Joint Session, General Geology; South Hall A, Public Auditorium. 11:00 A.M.; Joint Session, Vice-presidential Address: Pennsylvanian Sedimentation; South Hall A, Public Auditorium.

E *Section on Geology and Geography*—9:30 A.M.; Concurrent Session, Geography; Club Room A, Public Auditorium.

Zoological Sciences

F1 *American Society of Parasitologists*—9:00 A.M.; Session; Parlors A and B, Hollenden.

F2 *American Society of Protozoologists*—9:00 A.M.; Session; Parlor C, Hollenden.

F3 *American Society of Zoologists*—9:00 A.M.; Meeting of Executive Council; Parlor H, Hollenden.

F5 *Herpetologists League*—10:30 A.M.; Conference of Midwestern Herpetologists; Cypress Room, Hollenden.

Zoological and Botanical Sciences

FG2 and A *Biometric Society, Eastern North American Region; and Section on Mathematics*—9:00 A.M.; Joint Symposium: Mathematical Biology and Biometry, Part I; Grand Ballroom, Carter.

FG4 *National Association of Biology Teachers*—8:00 A.M.; Meeting of Board of Directors; Parlor G, Statler.

FG4, Q4, X1 *National Association of Biology Teachers and other Science Teaching Societies Affiliated with the AAAS (NSTA and ANSS)*—10:00 A.M.; Joint Panel: Outdoor Resources for Learning Science, planned by ANSS; Grand Ballroom, Statler.

FG5 *American Institute of Biological Sciences and AAAS*—9:00 A.M.; Joint presentation of plans for future meetings of the institute and of the Association; Cypress Room, Hollenden.

Social and Economic Sciences

K2 and K3 *National Academy of Economics and Political Science in collaboration with Pi Gamma Mu*—10:00 A.M.; Industrial Research; Pine Room, Statler.

Education

Q *Section on Education*—9:30 A.M.; Concurrent Session B; Parlor E, Statler.

Q and Q2 *Section on Education and the American Educational Research Association*—9:30 A.M.; Joint Session A; Parlor C, Statler.

Q4, FG4, and X1 *National Science Teachers Association and other Science Teaching Societies Affiliated with the AAAS (NABT and ANSS)*—10:00 A.M.; Joint Session, Panel: Outdoor Resources for Learning Science (planned by ANSS); Grand Ballroom, Statler.

Science in General

X1 *American Nature Study Society*—8:00 A.M.; Meeting of Board of Directors; Parlor F, Statler. 10:00

A.M.; Joint Panel, arranged by ANSS; Grand Ballroom, Statler; (See program immediately preceding.)

X4 *Sigma Delta Epsilon*—9:00 A.M.; National Council Meeting; Parlor B, Statler.

Wednesday Noon and Afternoon

AAAS as a Whole

2:00 P.M.; Symposium: Science and Human Values, Session II; Ballroom, Public Auditorium.

AAAS Council Meeting—4:00 P.M.; Pine Room, Statler.

Mathematics

A and FG2 *Section on Mathematics and Biometric Society, Eastern North American Region*—2:00 P.M.; Joint Symposium: Mathematical Biology and Biometry, Part II; Grand Ballroom, Carter.

Physics

B and D *Section on Physics and Section on Astronomy*—2:00 P.M.; Joint Symposium: Fifty Years of Quantum Theory in Astronomy; Club Room B, Public Auditorium.

B1 *American Meteorological Society*—2:00 P.M.; Conference of Midwestern Meteorologists; Chester Room, Allerton.

Chemistry

C *Section on Chemistry*—2:00 P.M.; Contributed Papers; South Hall C, Public Auditorium.

Astronomy

D and B *Section on Astronomy and Section on Physics*—2:00 P.M.; Joint Symposium: Fifty Years of Quantum Theory in Astronomy; Club Room B, Public Auditorium.

Geology and Geography

E and E1 *Section on Geology and Geography and the Geological Society of America*—2:00 P.M.; Joint Session, General Geology; South Hall A, Public Auditorium.

E *Section on Geology and Geography*—2:00 P.M.; Concurrent Session, Geography; Club Room A, Public Auditorium.

Zoological Sciences

F *Section on Zoological Sciences*—4:30 P.M.; Business Meeting; Ballroom, Hollenden.

F1 *American Society of Parasitologists*—2:00 P.M.; Session; Parlors A and B, Hollenden.

F2 *American Society of Protozoologists*—2:00 P.M.; Session; Parlor C, Hollenden.

F3 *American Society of Zoologists*—2:00 P.M.; Symposium: Transition from Aquatic to Land Life; Ballroom, Hollenden. 4:30 P.M.; Annual Business Meeting (following the business meeting of Section F); Ballroom, Hollenden.

Zoological and Botanical Sciences

FG1 *American Microscopical Society*—12:15 P.M.; Executive Committee Luncheon and Business Meeting; Parlor E, Hollenden.

FG2 and A *Biometric Society, Eastern North American Region, and Section on Mathematics*—2:00 P.M.;

Joint Symposium: Mathematical Biology and Biometry, Part II; Grand Ballroom, Carter.

FG4 and X1 *National Association of Biology Teachers and American Nature Study Society*—2:00 P.M.; Joint Panel: Using Outdoor Resources to Teach Nature; Grand Ballroom, Statler.

Botanical Sciences

G *Section on Botanical Sciences*—2:00 P.M.; Contributel Papers; South Hall B, Public Auditorium.

Social and Economic Sciences

K and M *Section on Social and Economic Sciences and Section on Engineering*—2:00 P.M.; Joint Session, Social Physics; Green Room, Allerton.

K3 *Pi Gamma Mu*—12:00 noon; Luncheon for officers and speakers on programs of Section K and the National Academy of Economics and Political Science; Tavern Room, Statler.

Engineering

M and K *Section on Engineering and Section on Social and Economic Sciences*—2:00 P.M.; Joint Session, Social Physics; Green Room, Allerton.

Education

Q *Section on Education*—2:30 P.M.; Concurrent Session A; Parlor C, Statler.

Q and Q2 *Section on Education and the American Educational Research Association*—2:30 P.M.; Concurrent Session B; Parlor E, Statler.

Q4 *National Science Teachers Association*—2:00 P.M.; Utilization and Conservation of Resources; Euclid Ballroom, Statler.

Science in General

X1 and FG4 *American Nature Study Society and National Association of Biology Teachers*—2:00 P.M.; Joint Panel: Using Outdoor Resources to Teach Nature; Grand Ballroom, Statler.

X2 *National Association of Science Writers*—2:00 P.M.; Problems of Reporting Scientific Developments in the Press; Pine Room, Statler.

X4 *Sigma Delta Epsilon*—12:30 P.M.; Luncheon for All Women in Science; Ohio Room, Statler.

Wednesday Evening

AAAS as a Whole

The Society of the Sigma Xi—8:00 P.M.; Annual Lecture, illustrated by electron micrographs: The Macromolecular Texture of Biological Materials; Ballroom, Public Auditorium.

Fifth Annual Junior Scientists Assembly—8:00 P.M.; Pine Room, Statler.

National Geographic Society—8:15 P.M.; Annual Lecture with Sound Film in Color on Archaeological Explorations in Panama; Music Hall, Public Auditorium.

Physics

B *Section on Physics*—7:00 P.M.; Dinner of Section B and Vice-presidential Address; Otis Room, Allerton.

Geology and Geography

E and E1 *Section on Geology and Geography and the*

Geological Society of America—7:00 P.M.; Joint Session, Program for Nonprofessionals, Part I; Grand Ballroom, Carter. 9:00 P.M.; Geologists' Smoker; Grand Ballroom, Carter.

E2 *National Geographic Society*—8:15 P.M.; Annual Lecture, with Sound Film in Color, on Archaeological Explorations in Panama; Music Hall, Public Auditorium.

Zoological Sciences

F1 *American Society of Parasitologists*—7:00 P.M.; Dinner and Business Meeting, Officers and Members of the Council; Parlor G, Hollenden.

F4 *Society of Systematic Zoology*—8:00 P.M.; Symposium: The Role of Systematics in Modern Zoology; Ballroom, Hollenden.

Zoological and Botanical Sciences

FG4 *National Association of Biology Teachers*—10:00 P.M.; All-Societies Mixer; Grand Ballroom, Statler.

Botanical Sciences

G *Section on Botanical Sciences*—8:00 P.M.; Vice-presidential Address: Remarks on the Future of Section G and Botanical Meetings; Section G Business Meeting; Parlor A, Hollenden.

Psychology

I and Q *Section on Psychology and Section on Education*—8:00 P.M.; Joint Program, Vice-presidential Addresses of Section I and Section Q; Euclid Ballroom, Statler.

Engineering

M and M2 *Section on Engineering and the Cleveland Engineering Society*—8:00 P.M.; Joint Session; South Hall A, Public Auditorium.

Education

Q and I *Section on Education and Section on Psychology*—8:00 P.M.; Joint Program, Vice-presidential Addresses of Section Q and Section I; Euclid Ballroom, Statler.

Q4 *National Science Teachers Association*—8:00 P.M.; Fifth Annual Junior Scientists Assembly; Pine Room, Statler.

Q4, FG4, X1 *National Science Teachers Association*—10:00 P.M.; All-Societies Mixer; Grand Ballroom, Statler.

Science in General

X1 *American Nature Study Society*—7:30 P.M.; Annual Meeting of the ANSS; Grand Ballroom, Statler. 10:00 P.M.; All-Societies Mixer; Grand Ballroom, Statler.

X2 *National Association of Science Writers*—7:30 P.M.; Business Meeting; Parlor L, Statler.

X5 *The Society of the Sigma Xi*—8:00 P.M.; Annual Address, illustrated with electron micrographs: The Macromolecular Texture of Biological Materials; Ballroom, Public Auditorium.

Thursday, December 28

Thursday Morning

Mathematics

A and FG2 *Section on Mathematics and Biometric Society, Eastern North American Region*—9:00 A.M.;

Joint Symposium: Mathematical Biology and Biometry, Part III; Grand Ballroom, Carter.

Physics

B and E Section on Physics and Section on Geology and Geography—10:00 A.M.; Joint Symposium: The Implications of Nuclear Phenomena in Geology; South Hall B, Public Auditorium.

B2 and B3 Oak Ridge Institute of Nuclear Studies and the Oak Ridge National Laboratory—9:30 A.M.; Joint Session; Ballroom, Public Auditorium.

Chemistry

C Section on Chemistry—8:45 A.M.; Symposium: Steroid Hormones, Part I; Club Room B, Public Auditorium.

Geology and Geography

E Section on Geology and Geography—8:00 A.M.; Start of Geography Field Trip in the Cleveland Area; Lobby, Carter.

E and E1 Section on Geology and Geography and the Geological Society of America—9:00 A.M.; Joint Session, Program for Nonprofessionals, Part II; Club Room A, Public Auditorium. 9:00 A.M.; Concurrent Joint Session with Section B, (See **B** and **E** above).

F3 American Society of Zoologists—9:00 A.M.; Contributed Papers; Embassy Room, Carter.

Zoological Sciences

F1 American Society of Parasitologists—9:00 A.M.; Symposium: Host-Parasite Relationships among the Helminths; Parlors A and B, Hollenden. 11:00 A.M.; Commemoration of Twenty-fifth Anniversary; Parlors A and B, Hollenden. 11:30 A.M.; Presidential Address, Parlors A and B, Hollenden.

F2 American Society of Protozoologists—9:00 A.M.; Session, Parlor C, Hollenden.

F3 American Society of Zoologists—9:00 A.M.; Concurrent Session 1, General Physiology; West half of Ballroom, Hollenden. 9:00 A.M.; Concurrent Session 2, Embryology; East half of Ballroom, Hollenden. 9:00 A.M.; Concurrent Session 3, Endocrinology; Assembly Room, Hollenden. 9:00 A.M.; Concurrent Session 4, Cytology and Protozoology; Cypress Room, Hollenden.

Zoological and Botanical Sciences

FG2 and A Biometric Society, Eastern North American Region and Section on Mathematics—9:00 A.M.; Joint Symposium: Mathematical Biology and Biometry, Part III; Grand Ballroom, Carter.

FG4 National Association of Biology Teachers and other Science Teaching Societies Affiliated with AAAS (NSTA and ANSS)—10:00 A.M.; Joint Symposium: Human Resources for Learning Science, arranged by NABT; Grand Ballroom, Statler.

Botanical Sciences

G Section on Botanical Sciences—9:00 A.M.; Contributed Papers; South Hall C, Public Auditorium.

Anthropology

H and I1 Section on Anthropology and the Society for

Research in Child Development—9:30 A.M.; Joint Session; Mather Room, Allerton.

Psychology

I Section on Psychology—9:00 A.M.; Concurrent Session 1, Seminar: Psychological Research in the Air Force, Part I; Ohio Room, Statler. 10:00 A.M.; Concurrent Session 2, Contributed Papers; Room 345, Statler. 10:30 A.M.; Concurrent Session 3, Seminar: Psychological Research in the Navy, Part I; Ohio Room, Statler.

I1 Society for Research in Child Development—9:30 A.M.; Joint Session. (See **H** and **I1** preceding.)

Social and Economic Sciences

K Section on Social and Economic Sciences—9:30 A.M.; Symposium: Characteristics of the Urban Labor Force; South Hall A, Public Auditorium.

Medical Sciences

N3 and N6 Subsection on Pharmacy, Np, and the American Pharmaceutical Association, Scientific Section—9:30 A.M.; Joint Session, Contributed Papers; Club Room C, Public Auditorium.

Education

Q4, FG4, and X1 National Science Teachers Association and the other Science Teaching Societies Affiliated with the AAAS (NABT and ANSS)—10:00 A.M.; Joint Symposium: Human Resources for Learning Science, arranged by NABT; Grand Ballroom, Statler.

Science in General

X1 American Nature Study Society—10:00 A.M.; Joint Symposium; Grand Ballroom, Statler. (See program just above.)

X4 Sigma Delta Epsilon—7:30 A.M.; Breakfast and Grand Chapter Business Meeting; Parlor E, Statler.

Thursday Noon and Afternoon

AAAS as a Whole

AAAS—George Westinghouse Science Writing Awards, Luncheon. (By invitation only.)—Grand Ballroom, Statler.

Mathematics

A and FG2 Section on Mathematics and Biometric Society, Eastern North American Region—2:00 P.M.; Joint Symposium: Mathematical Biology and Biometry, Part IV; Grand Ballroom, Carter.

Physics

B and F Section on Physics and Section on Zoological Sciences—2:00 P.M.; Joint Symposium: The Implications of Nuclear Phenomena in Biology; South Hall B, Public Auditorium.

B2 and B3 Oak Ridge Institute of Nuclear Studies and Oak Ridge National Laboratory—2:00 P.M.; Joint Session, Seminar: Ten Years of Atomic Energy—A Review of Progress; Ballroom, Public Auditorium.

Chemistry

C Section on Chemistry—2:00 P.M.; Symposium: Steroid Hormones, Part II; Club Room B, Public Auditorium.

Geology and Geography

E and O *Section on Geology and Geography and Section on Agriculture*—2:00 P.M.; Joint Symposium: The Interrelations of Soil Science and Geology, Part I; South Hall C, Public Auditorium.

E3 *National Speleological Society*—2:00 P.M.; Contributed Papers; Embassy Room, Carter.

Zoological Sciences

F and B *Section on Zoological Sciences and Section on Physics*—2:00 P.M.; Joint Symposium: The Implications of Nuclear Phenomena in Biology; South Hall B, Public Auditorium.

F1 *American Society of Parasitologists*—1:00 P.M.; Annual Luncheon and Business Meeting; East half of Ballroom, Hollenden.

F1 and F3 *American Society of Parasitologists and American Society of Zoologists*—2:45 P.M.; Joint Session, Demonstrations; Laboratory Rooms 30, 41, and 20, Biology Building, Western Reserve University.

F2 *American Society of Protozoologists*—2:00 P.M.; Session; Parlor C, Hollenden.

F3 *American Society of Zoologists*—2:15 P.M.; Concurrent Session 1, Cellular Physiology; Lecture Room 44, Biology Building, Western Reserve University. 2:15 P.M.; Concurrent Session 2, Joint Session with the American Society of Parasitologists, Demonstrations; Laboratory Rooms 30, 41, and 20, Biology Building, Western Reserve University. 2:15 P.M.; Concurrent Session 3, Demonstrations by motion pictures; Auditorium, Cleveland Academy of Medicine.

Zoological and Botanical Sciences

FG2 and A *Biometric Society, Eastern North American Region, and Section on Mathematics*—2:00 P.M.; Joint Symposium: Mathematical Biology and Biometry, Part IV; Grand Ballroom, Carter.

FG4 *National Association of Biology Teachers*—12:30 P.M.; NABT Luncheon; Mather Room, Allerton. 2:00 P.M.; Program Planning in Biology; Mather Room, Allerton.

Anthropology

H and H1 *Section on Anthropology and the Society for Applied Anthropology*—2:00 P.M.; Joint Session; Ballroom, Allerton.

Psychology

I *Section on Psychology*—1:00 P.M.; Concurrent Session 4, Seminar: Psychological Research in the Air Force, Part II; Ohio Room, Statler. 1:30 P.M.; Concurrent Session 5; Contributed Papers in Physiological Psychology; Room 345, Statler. 2:30 P.M.; Concurrent Session 6, Seminar: Psychological Research in the Navy, Part II; Ohio Room, Statler.

Social and Economic Sciences

K *Section on Social and Economic Sciences*—12:00 noon; Luncheon Session; Planning for the Future of Section K; Tavern Room, Statler. 2:30 P.M.; The Growth of the Cleveland Region; South Hall A, Public Auditorium.

K1 *American Home Economics Association*—2:00

P.M.; Child Development and Home Economics Education; Otis Room, Allerton.

History and Philosophy of Science

L1 *History of Science Society*—2:30 P.M.; Session; English Room, Carter.

Engineering

Mand M3 *Section on Engineering and Case Institute of Technology*—2:00 P.M.; Joint Symposium: The Human Body as a Factor in Engineering; Club Room A, Public Auditorium.

Medical Sciences

N3 and N6 *Subsection on Pharmacy, Np, and the American Pharmaceutical Association, Scientific Section*—2:00 P.M.; Joint Session, Contributed Papers; Club Room C, Public Auditorium.

N4 *Alpha Epsilon Delta National Premedical Honor Society*—12:15 P.M.; Luncheon and Session; Parlor B, Hollenden.

Agriculture

O and E *Section on Agriculture and Section on Geology and Geography*—2:00 P.M.; Joint Symposium: The Interrelations of Soil Science and Geology, Part I; South Hall C, Public Auditorium.

Education

Q and Q3 *Section on Education and the Foundation for Integrated Education*—2:30 P.M.; Joint Symposium: Integrative Studies for General Education; Pine Room, Statler.

Q4 *National Science Teachers Association*—12:30 P.M.; NABT Luncheon; Mather Room, Allerton. 2:00 P.M.; Program Planning in the Physical Sciences; Green Room, Allerton.

Science in General

X1 *American Nature Study Society*—12:30 P.M.; NABT Luncheon; Mather Room, Allerton. 2:15 P.M.; Session; Euclid Ballroom, Statler.

X4 *Sigma Delta Epsilon*—4:30 P.M.; Tea for Alumnae; Parlor B, Statler.

Thursday Evening

AAAS as a Whole

AAAS Presidential Address—8:00 P.M.; "Science and Human Affairs"; Grand Ballroom, Statler.

AAAS Reception—9:00 P.M.; Euclid Ballroom and adjacent rooms, Statler. (Open only to registrants.)

Zoological Sciences

F4 *Society of Systematic Zoology*—7:30 P.M.; Council Meeting; Parlor F, Hollenden.

Social and Economic Sciences

K *Section on Social and Economic Sciences*—8:00 P.M.; Symposium on Viewpoints, Problems, and Methods of Research in Urban Areal Studies from the Standpoint of Different Disciplines; Parlor E, Statler.

History and Philosophy of Science

L1 *History of Science Society*—7:00 P.M.; Council Meeting; Gay Nineties Room, Carter.

Friday, December 29

Friday Morning

AAAS as a Whole

AAAS Council Meeting—9:00 A.M.; Pine Room, Statler.

Mathematics

A and PG2 *Section on Mathematics and Biometric Society, Eastern North American Region*—9:00 A.M.; Joint Symposium: Mathematical Biology and Biometry, Part V; Grand Ballroom, Carter.

Chemistry

C *Section on Chemistry*—8:45 A.M.; Symposium: Advances in Inorganic Chemistry, Part I; Club Room B, Public Auditorium.

Geology and Geography

E and O *Section on Geology and Geography and Section on Agriculture*—9:00 A.M.; Joint Symposium: The Interrelations of Soil Science and Geology, Part II; South Hall C, Public Auditorium.

Zoological Sciences

F, F3, and N1 *Section on Zoological Sciences, American Society of Zoologists, and Subsection on Medicine, Nm*—9:30 A.M.; Joint Session, Symposium: Radiobiology, Part I; Ballroom, Public Auditorium.

F1 *American Society of Parasitologists*—9:00 A.M.; Parlors A and B, Hollenden.

F3 *American Society of Zoologists*—9:00 A.M.; Concurrent Session 1, Animal Behavior and Sociobiology; Ballroom, Hollenden. 9:00 A.M.; Concurrent Session 2, Endocrinology; Assembly Room, Hollenden. 9:30 A.M.; Concurrent Session 3; Joint Session with Section F and Subsection Nm, Symposium: Radiobiology, Part I; Ballroom, Public Auditorium.

F4 *Society of Systematic Zoology*—8:00 A.M.; Annual Breakfast; Parlor C, Hollenden.

Zoological and Botanical Sciences

FG1 *American Microscopical Society*—9:00 A.M.; Symposium: Modern Methods for Microscopy; Parlor E, Hollenden.

FG2 and A *Biometric Society, North American Region, and Section on Mathematics*—9:00 A.M.; Joint Symposium: Mathematical Biology and Biometry, Part V; Grand Ballroom, Carter.

FG3 *Ecological Society of America*—9:00 A.M.; Joint Symposium. (See **G** and **FG3** below.)

FG4, Q4, X1 *National Association of Biology Teachers and other Science Teaching Societies Affiliated with the AAAS (NSTA and ANSS)*—8:00 A.M.; Meeting of the Officers to plan the 1951 Coordinated Program; Parlor M, Statler. 10:00 A.M.; Joint Symposium: Industrial and Technological Resources for Learning Science; arranged by NSTA; Grand Ballroom, Statler.

Botanical Sciences

G and FG3 *Section on Botanical Sciences and the Ecological Society of America*—9:00 A.M.; Joint Symposium: The Ecological Background of Evolution; South Hall A, Public Auditorium.

Anthropology

H and H1 *Section on Anthropology and the Society*

for Applied Anthropology—9:30 A.M.; Joint Session, American Character and the Administration of Native Peoples; Mather Room, Allerton.

Psychology

I *Section on Psychology*—9:00 A.M.; Concurrent Session 7, Seminar: Psychological Research in the Army, Part I; Room 345, Statler. 10:00 A.M.; Concurrent Session 8, Symposium: The Role of the Frontal Lobes in Behavior; Ohio Room, Statler. 10:30 A.M.; Concurrent Session 9, Seminar: Psychological Research in the Public Services; Room 345, Statler.

History and Philosophy of Science

L, L1, and L2 *Section on History and Philosophy of Science, History of Science Society, and the Philosophy of Science Association*—9:30 A.M.; Joint Session, arranged by the History of Science Society: The Social Relations of Science in Historical Perspective; Club Room A, Public Auditorium.

Engineering

M *Section on Engineering*—9:00 A.M.; Symposium: Nuclear Engineering, Part I; South Hall B, Public Auditorium.

Medical Sciences

N1, F, and F3 *Subsection on Medicine, Nm, Section on Zoological Sciences, and the American Society of Zoologists*—9:30 A.M.; Joint Session, Symposium: Radiobiology, Part I; Ballroom, Public Auditorium.

N3 and N6 *Subsection on Pharmacy, Np, and the American Pharmaceutical Association, Scientific Section*—9:30 A.M.; Joint Session, Hospital Pharmacy Seminar, Part I; Club Room C, Public Auditorium.

Agriculture

O and E *Section on Agriculture and Section on Geology and Geography*—9:00 A.M.; Joint Symposium: The Interrelations of Soil Science and Geology, Part II; South Hall C, Public Auditorium.

Q4 *National Science Teachers Association*—8:30 A.M.; Science Teaching Films, Part II; Grand Ballroom, Statler.

Education

Q4, FG4, X1 *National Science Teachers Association and other Science Teaching Societies Affiliated with the AAAS (NABT and ANSS)*—8:00 A.M.; Meeting of the Officers to plan the 1951 Coordinated Program; Parlor M, Statler. 10:00 A.M.; Joint Symposium: Industrial and Technological Resources for Learning Science, arranged by NSTA; Grand Ballroom, Statler.

Science in General

X1, FG4, Q4 *American Nature Study Society and other Science Teaching Societies Affiliated with the AAAS (NABT and NSTA)*—8:00 A.M.; Meeting of the Officers to plan the 1951 Coordinated Program; Parlor M, Statler. 10:00 A.M.; Joint Symposium: Industrial and Technological Resources for Learning Science, arranged by NSTA; Grand Ballroom, Statler.

Friday Noon and Afternoon

AAAS as a Whole

Meeting of all Section Chairmen and Secretaries—12:00 noon; Luncheon and Business Meeting; Tavern Room, Statler.

Mathematics

A and FG2 *Section of Mathematics and Biometric Society, Eastern North American Region*—2:00 P.M.; Joint Symposium: Mathematical Biology and Biometry, Part VI; Grand Ballroom, Carter.

Chemistry

C *Section on Chemistry*—2:00 P.M.; Symposium: Advances in Inorganic Chemistry, Part II, Club Room B, Public Auditorium.

Geology and Geography

E and O *Section on Geology and Geography and Section on Agriculture*—2:00 P.M.; Joint Symposium: The Interrelations of Soil Science and Geology, Part III; South Hall C, Public Auditorium.

Zoological Sciences

F, F3, and I *Section on Zoological Sciences, American Society of Zoologists, and Section on Psychology*—2:00 P.M.; Concurrent Session 1, Joint Symposium: Genetics and Behavior; Ballroom, Hollenden.

F, F3, and N1 *Section on Zoological Sciences, American Society of Zoologists, and Subsection on Medicine, Nm*—2:00 P.M.; Concurrent Session 2, Joint Symposium: Radiobiology, Part II; Ballroom, Public Auditorium.

F1 *American Society of Parasitologists*—2:00 P.M.; Session; Parlors A and B, Hollenden.

F2 *American Society of Protozoologists*—12:30 P.M.; Luncheon and Business Meeting; Cypress Room, Hollenden.

F3 *American Society of Zoologists*—2:00 P.M.; Two concurrent joint symposia. (See **F**, **F3**, and **I**; and **F**, **F3**, and **N1** above.)

F4 *Society of Systematic Zoology*—2:00 P.M.; Annual Business Meeting; Assembly Room, Hollenden.

Zoological and Botanical Sciences

FG1 *American Microscopical Society*—4:00 P.M.; Annual Business Meeting; Parlor E, Hollenden.

FG2 and A *Biometric Society, Eastern North American Region, and Section on Mathematics*—2:00 P.M.; Joint Symposium: Mathematical Biology and Biometry, Part VI; Grand Ballroom, Carter.

FG4 *National Association of Biology Teachers*—2:00 P.M.; Special Techniques in the Teaching of Biology; Pine Room, Statler.

Anthropology

H *Section on Anthropology*—2:00 P.M.; Government and the Administration of Native Peoples; Mather Room, Allerton.

Psychology

I *Section on Psychology*—1:30 P.M.; Concurrent Session 11, Seminar: Psychological Research in the Army, Part II; Room 345, Statler. 2:00 P.M.; Concurrent Session 12, Seminar: Psychological Research in Industrial Consulting Firms; Ohio Room, Statler.

I, F, and F3 *Section on Psychology, Section on Zoological Sciences, and the American Society of Zoologists*—2:00 P.M.; Concurrent Session 10, Symposium: Genetics and Behavior; Ballroom, Hollenden.

History and Philosophy of Science

L and L2 *Section on History and Philosophy of Science and the Philosophy of Science Association*—2:00 P.M.; Joint Session; Club Room A, Public Auditorium.

L1 *History of Science Society*—2:30 P.M.; Session; Embassy Room, Carter.

Engineering

M *Section on Engineering*—2:00 P.M.; Symposium: Nuclear Engineering, Part II; South Hall B, Public Auditorium.

Medical Sciences

N1, F, and F3 *Subsection on Medicine, Nm, Section on Zoological Sciences, and American Society of Zoologists*—2:00 P.M.; Joint Session, Symposium: Radiobiology, Part II; Ballroom, Public Auditorium.

N3 and N6 *Subsection on Pharmacy, Np, and American Pharmaceutical Association, Scientific Section*—2:00 P.M.; Joint Session, Hospital Pharmacy Seminar, Part II; Club Room C, Public Auditorium.

Agriculture

O and E *Section on Agriculture and Section on Geology and Geography*—2:00 P.M.; Joint Symposium: The Interrelations of Soil Science and Geology, Part III; South Hall C, Public Auditorium.

Education

Q4 *National Science Teachers Association*—2:00 P.M.; Fourth National Conference on Industry-Science Teaching Relations, Session 1; Euclid Ballroom, Statler.

Science in General

X1 *American Nature Study Society*—2:00 P.M.; Session; Grand Ballroom, Statler.

X3 *Scientific Research Society of America*—4:00 P.M.; Annual Convention of the Scientific Research Society of America; Chester Room, Allerton.

X5 *The Society of the Sigma Xi*—2:00 P.M.; Annual Convention of the Society of the Sigma Xi; Chester Room, Allerton.

Friday Evening

AAAS as a Whole

Scientific Research Society of America—7:30 P.M.; Annual Address: The Partnership of Science and Engineering in Research, Joint Session with Section M; Ballroom, Allerton.

The United Chapters of Phi Beta Kappa—8:30 P.M.; Annual Address: Science and the National Welfare; Grand Ballroom, Statler.

Biologists' Smoker, jointly sponsored by the American Society of Zoologists—9:30 P.M. till 12:00 midnight; Main Exhibition Hall (under Arena), Public Auditorium. All registrants are cordially invited to attend. (Registration facilities will be available for nonregistrants.)

Chemistry

C *Section on Chemistry*—7:15 P.M.; Symposium: Antibiotics and Vitamins; Club Room B, Public Auditorium.

Zoological Sciences

F3 and F *American Society of Zoologists and Section*

on *Zoological Sciences*—6:00 P.M.; Zoologists' Dinner and Vice-presidential Address of Section F; Assembly Room, Hollenden. 9:30 P.M. till 12:00 midnight; Biologists' Smoker; Main Exhibition Hall (under Arena), Public Auditorium. (See note above.)

Zoological and Botanical Sciences

FG4 *National Association of Biology Teachers*—6:30 P.M.; ANSS Banquet; Euclid Ballroom, Statler.

History and Philosophy of Science

L and L2 *Section on the History and Philosophy of Science and the Philosophy of Science Association*—8:00 P.M.; Joint Session, Symposium: Scientific Method and Psychoanalysis; Club Room A, Public Auditorium.

L1 *History of Science Society*—7:00 P.M.; Annual Dinner; Spanish Room, Carter.

Engineering

M and X3 *Section on Engineering and the Scientific Research Society of America*—7:30 P.M.; Joint Session, Annual Address of RESA: The Partnership of Science and Engineering in Research; Ballroom, Allerton.

Medical Sciences

N2 *Subsection on Dentistry, Nd*—7:30 P.M.; Session; South Hall C, Public Auditorium.

N5 *American Dietetic Association*—8:00 P.M.; Session; Pine Room, Statler.

Education

Q4 *National Science Teachers Association*—6:30 P.M.; ANSS Banquet; Euclid Ballroom, Statler. 8:00 P.M.; Fourth National Conference on Industry-Science Teaching Relations, Session II; Ohio Room, Statler.

Science in General

X1 *American Nature Study Society*—6:30 P.M.; Annual Banquet and Illustrated Lecture; Euclid Ballroom, Statler.

X3 and M *Scientific Research Society of America and Section on Engineering*—7:30 P.M.; Annual Address: The Partnership of Science and Engineering in Research; Ballroom, Allerton.

X6 *The United Chapters of Phi Beta Kappa*—8:30 P.M.; Annual Address: Science and the National Welfare; Grand Ballroom, Statler.

Saturday, December 30

Saturday Morning

AAAS as a Whole

The Academy Conference—9:30 A.M.; Growth of Academies of Science; Euclid Ballroom, Statler. 10:00 A.M.; Organization of the Academy Conference and Business Meeting; Euclid Ballroom, Statler.

AAAS Cooperative Committee on the Teaching of Science and Mathematics—10:00 A.M.; Symposium: Teacher Training and Teachers' Workshops; Grand Ballroom, Statler.

Mathematics

A *Section on Mathematics*—10:00 A.M.; Symposium: Mathematics in Applied Science, Part I; Club Room C, Public Auditorium.

Chemistry

C *Section on Chemistry*—8:45 A.M.; Concurrent Session 1, Symposium: Agricultural Chemicals, Part I; South Hall B, Public Auditorium. 8:45 A.M.; Concurrent Session 2, Symposium: Forensic Science, Part I; Club Room B, Public Auditorium.

Zoological Sciences

F3 *American Society of Zoologists*—9:00 A.M.; Concurrent Session 1, General Physiology; Ballroom, Hollenden. 9:00 A.M.; Concurrent Session 2, Embryology; Assembly Room, Hollenden. 9:00 A.M.; Concurrent Session 3, General Morphology and Ecology; Cypress Room, Hollenden.

Zoological and Botanical Sciences

FG3 *Ecological Society of America*—9:00 A.M.; Joint Symposium. (See G and FG3 below.)

FG4 and X1 *National Association of Biology Teachers and American Nature Study Society*—9:00 A.M.; Start of Joint All-day Field Trip; Lobby, Statler.

Botanical Sciences

G and FG3 *Section on Botanical Sciences and the Ecological Society of America*—9:00 A.M.; Joint Symposium: The Structure and Analysis of Plant Communities, Part I; South Hall A, Public Auditorium.

Anthropology

H *Section on Anthropology*—9:30 A.M.; Linguistics and Anthropological Theory; Mather Room, Allerton.

History and Philosophy of Science

L and L2 *Section on the History and Philosophy of Science and the Philosophy of Science Association*—9:30 A.M.; Joint Session, Symposium: Methodological Issues in Recent Studies of National Character; Club Room A, Public Auditorium.

Medical Sciences

N1 *Subsection on Medicine, Nm*—9:30 A.M.; Symposium: Radiobiology, Part III; Ballroom, Public Auditorium.

N2 *Subsection on Dentistry, Nd*—9:00 A.M.; Contributed Papers; South Hall C, Public Auditorium.

Education

Q1 *AAAS Cooperative Committee on the Teaching of Science and Mathematics*—10:00 A.M.; Symposium: Teacher Training and Teachers' Workshops; Grand Ballroom, Statler.

Q4 *National Science Teachers Association*—9:00 A.M.; Start of All-day Field Trip sponsored by ANSS and NABT; Lobby, Statler.

Science in General

X1 and FG4 *American Nature Study Society and the National Association of Biology Teachers*—9:00 A.M.; Start of Joint All-day Field Trip; Lobby, Statler.

X7 *The Academy Conference*—9:30 A.M.; Session; Euclid Ballroom, Statler. 10:00 A.M.; Presidential Address and Business Session; Euclid Ballroom, Statler.

Saturday Noon and Afternoon

AAAS as a Whole

The Academy Conference—2:30 P.M.; Panel: Effects

of Government Support on Scientific Research; Grand Ballroom, Statler.

Mathematics

A Section on Mathematics—2:00 P.M.; Symposium: Mathematics in Applied Science, Part II; Club Room C, Public Auditorium.

Chemistry

C Section on Chemistry—12:15 P.M.; Chemists' Luncheon; Ballroom, Allerton. 2:15 P.M.; Concurrent Session 1, Symposium: Agricultural Chemicals, Part II; South Hall B, Public Auditorium. 2:15 P.M.; Concurrent Session 2, Symposium: Forensic Science, Part II; Club Room B, Public Auditorium.

Zoological and Botanical Sciences

FG3 Ecological Society of America—2:00 P.M.; Joint Symposium. (See **G** and **FG3** below.)

Botanical Sciences

G and **FG3** Section on Botanical Sciences and the Ecological Society of America—2:00 P.M.; Joint Symposium: The Structure and Analysis of Plant Communities, Part II; South Hall A, Public Auditorium.

Anthropology

H Section on Anthropology—2:00 P.M.; Session; Mather Room, Allerton.

History and Philosophy of Science

L and **L2** Section on the History and Philosophy of Science and the Philosophy of Science Association—2:00 P.M.; Joint Session, Symposium: Logic and the Laws of Nature; Club Room A, Public Auditorium.

Medical Sciences

N1 Subsection on Medicine, **Nm**—2:00 P.M.; Symposium: Radiobiology, Part IV; Ballroom, Public Auditorium.

N2 Subsection on Dentistry, **Nd**—2:00 P.M.; Contributed Papers; South Hall C, Public Auditorium.

Education

Q4 National Science Teachers Association—2:30 P.M.; The Academy Conference Program. (See **X7** below.)

Science in General

X7 The Academy Conference—2:30 P.M.; Panel: Effects of Government Support on Scientific Research; Grand Ballroom, Statler.

Saturday Evening

AAAS as a Whole

The Academy Conference—6:30 P.M.; Academy Conference Dinner (Officers and delegates of the State and City Academies of Science affiliated with the AAAS); Tavern Room, Statler.

The Academy Conference Evening Address—8:00 P.M.; Grand Ballroom, Statler. Subject: "The Emperor's New Clothes, or *Prins Dementat*."

The Science Theatre

The AAAS Science Theatre, a permanent feature of the Association's annual meetings, presents a showing of the latest domestic and foreign scientific films almost

continuously throughout the meeting period. Note, in the following schedule, that programs are both repeated and transposed to increase the opportunities for those attending the sessions of the 117th Meeting to see particular films. The Association is greatly indebted to all those who lent these pictures for showing.

Location. The Science Theatre is in the Little Theatre of the Cleveland Public Auditorium. The capacity of this room, which is particularly designed for projection, is 678. The Science Theatre is entered from the Arena or adjacent corridors of the Cleveland Public Auditorium, when the *Annual Science Exposition* is open (9:00 A.M.—5:00 P.M. and 7:00 P.M.—9:00 P.M.); when the Exposition is closed, and programs are continuing, however, the Little Theatre may be entered from St. Clair Avenue.

Admission. The Science Theatre is a feature for the pleasure and information of all attending the Annual Meeting; it is deemed well worth the considerable projection costs. It cannot be for the casual passerby; thus, admission is restricted to those who wear the *AAAS Convention Badge*—or who show an Association Registration Receipt.

Hours

Tuesday, Dec. 26—1:30 P.M. to 5:30 P.M. and 7:00 P.M. to 11:00 P.M.

Wednesday, Dec. 27—9:00 A.M. to 1:00 P.M. and 1:30 P.M. to 5:30 P.M. and 7:00 P.M. to 11:00 P.M.

Thursday, Dec. 28—9:00 A.M. to 1:00 P.M. and 1:30 P.M. to 5:30 P.M. and 7:00 P.M. to 11:00 P.M.

Friday, Dec. 29—9:00 A.M. to 1:00 P.M. and 1:30 P.M. to 5:30 P.M.

Saturday, Dec. 30—9:00 A.M. to 1:00 P.M. and 1:30 P.M. to 5:30 P.M.

PROGRAM 1

Tuesday Afternoon, December 26, 1:30 P.M.—5:30 P.M.

1. EXPLORING FOR OIL. Department of the Navy. Color, 30 minutes.
2. SILICA CEMENTS. Bureau of Standards. Color, 18 minutes.
3. OVER-DEPENDENCY. National Film Board of Canada. Black-and-white, 32 minutes.
4. SYNTHETIC FIBERS. Encyclopaedia Britannica Films, Inc. Black-and-white, 14 minutes.
5. PUDENDAL BLOCK WITH DEMEROL AND INTRACAINE. Dr. Lees M. Schadel, Jr., Philadelphia, Pa. Color, 9 minutes.
6. THE EPIDEMIOLOGY OF INFLUENZA. U. S. Public Health Service. Black-and-white, 14 minutes.
7. SMOKE JUMPERS. U. S. Forest Service. Color, 10 minutes.
8. FOREST CONSERVATION. Encyclopaedia Britannica Films, Inc. Color, 11 minutes.
9. PREFACE TO LIFE. National Institute of Mental Health. Black-and-white, 30 minutes.
10. HYDRAULIC CONTROLS, J. I. Case Company. Color, 15 minutes.
11. GRASS AND CATTLE. U. S. Forest Service. Color, 15 minutes.
12. BIKINI—RADIOLOGICAL LABORATORY. Atomic Energy Commission. Color, 22 minutes.

PROGRAM 2

Tuesday Evening, December 26, 7:00 P.M.-11:00 P.M.

1. LIFE OF A PLANT. Encyclopaedia Britannica Films, Inc. Color, 11 minutes.
2. 24 HOURS OF PROGRESS. Standard Oil Company (N. J.). Black-and-white, 28 minutes.
3. FIRE FIGHTING WITH WETTER WATER. Union Carbide & Carbon Corp. Color, 20 minutes.
4. THE EARS AND HEARING. Encyclopaedia Britannica Films, Inc. Black-and-white, 11 minutes.
5. THE GIFT OF TS'AI LUN—PAPER. Hammermill Paper Co. Color, 33 minutes.
6. ANTARCTIC EXPEDITION. Department of the Navy. Black-and-white, 18 minutes.
7. THE FOREST GROWS. Encyclopaedia Britannica Films, Inc. Color, 11 minutes.
8. BIRTH OF AN OIL FIELD. Shell Oil Company. Color, 30 minutes.
9. HOW HOT IS STEEL? British Information Services. Black-and-white, 6 minutes.
10. ALLERGY: IMMUNOLOGY—DIAGNOSIS—TREATMENT. Wyeth, Inc. Color, 55 minutes.

PROGRAM 3

Wednesday Morning, December 27, 9:00 A.M.-1:00 P.M.

1. THE THINNEST SLICE. University of Southern California. Black-and-white, 20 minutes.
2. PHOTO CANADA. National Film Board of Canada. Color, 32 minutes.
3. STRIKING BACK AGAINST RABIES. U. S. Public Health Service. Black-and-white, 14 minutes.
4. WISCONSIN CORN HYBRIDS. University of Wisconsin College of Agriculture. Color, 45 minutes.
5. EXERCISE YUKON. Department of the Army. Black-and-white, 25 minutes.
6. THE FOREST PRODUCES. Encyclopaedia Britannica Films, Inc. Color, 11 minutes.
7. MISSOURI AND ITS NATURAL RESOURCES. Bureau of Mines. Color, 33 minutes.
8. AGRICULTURE AND FISHING IN JAPAN. Department of the Army. Black-and-white, 27 minutes.

PROGRAM 4

Wednesday Afternoon, December 27, 1:30 P.M.-5:30 P.M.

1. KNOW YOUR RESOURCES. National Film Board of Canada. Black-and-white, 20 minutes.
2. UNDERWATER DEMOLITION TEAM. Department of the Navy. Black-and-white, 12 minutes.
3. CHALLENGE: SCIENCE AGAINST CANCER. National Cancer Institute. Black-and-white, 30 minutes.
4. YOU KNOW MY METHODS, WATSON. British Information Services. Black-and-white, 5 minutes.
5. WHAT'S IN THE BAG. National Fertilizer Association. Color, 18 minutes.
6. PARFUTIN. U.S. Air Force. Black-and-white, 15 minutes.
7. THE STORY OF MILLIKEN WOOLENS. Milliken Fabrics. Color, 30 minutes.
8. WIREWORM RESEARCH. British Information Services. Black-and-white, 12 minutes.
9. UNCONSCIOUS MOTIVATION. Association Films, Inc. Black-and-white, 30 minutes.

10. AVALANCHES TO ORDER. U. S. Forest Service. Color, 17 minutes.
11. THE INFLUENCE OF GEOGRAPHY AND HISTORY ON THE PORT OF NEW YORK. Geographic Pictures. Color, 10 minutes.
12. REFINING OIL FOR ENERGY. Shell Oil Company. Color, 22 minutes.

PROGRAM 5

Wednesday Evening, December 27, 7:00 P.M.-11:00 P.M.

1. SNOWBOUND. Department of the Army. Black-and-white, 25 minutes.
2. VEGETABLE INSECTS. International Film Bureau Inc. Color, 23 minutes.
3. FASTER THAN SOUND. British Information Services. Black-and-white, 10 minutes.
4. LIFE CYCLE OF *Dipyllobothrium latum*. U. S. Public Health Service. Black-and-white, 20 minutes.
5. THE FIGHT AGAINST THE COMMUNICABLE DISEASES. U. S. Public Health Service. Color, 20 minutes.
6. VOCALIZATION AND SPEECH IN CHIMPANZEES. Yerkes Laboratories of Primate Biology. Black-and-white, 12 minutes.
7. YOUR VOICE. Encyclopaedia Britannica Films, Inc. Black-and-white, 11 minutes.
8. THE OXY-ACETYLENE FLAME—MASTER OF METALS. Bureau of Mines. Color, 19 minutes.
9. WAVES OF GREEN. Dearborn Motors Corporation. Color, 40 minutes.
10. GLACIER FRONTIER. American Geographical Society. Color, 25 minutes.
11. A TREE GROWS FOR CHRISTMAS. U. S. Forest Service. Color, 11 minutes.
12. RED RUNS THE FRASER. National Film Board of Canada. Color, 10 minutes.

PROGRAM 6

Thursday Morning, December 28, 9:00 A.M.-1:00 P.M.

1. TERRA INCOGNITA. North American Philips Co. Black-and-white, 25 minutes.
2. DUTCH ELM DISEASE. National Film Board of Canada. Color, 11 minutes.
3. LANDBUILDERS. The Netherlands Information Bureau. Black-and-white, 20 minutes.
4. A MILE BELOW THE WHEAT. Standard Oil Company (N. J.) Color, 20 minutes.
5. BORAX FROM DESERT TO FARM. American Potash Institute. Color, 25 minutes.
6. PROSPECTING FOR PETROLEUM. Shell Oil Company. Color, 23 minutes.
7. THE COLUMBIA: AMERICA'S GREATEST POWER STREAM. Bonneville Power Administration. Black-and-white, 20 minutes.
8. MORE FOOD FROM FEWER ACRES. J. I. Case Company. Black-and-white, 22 minutes.
9. MAN-MADE CANYON. Bureau of Mines. Black-and-white, 19 minutes.
10. ASIDE FOR THE HERRING FLEET AND FERTILIZING THE SEA. British Information Services. Black-and-white, 6 minutes.

11. OPERATION VITTLES. U. S. Air Force. Black-and-white, 15 minutes.
12. THE MALE SEX HORMONE. Schering Corporation. Color, 20 minutes.

PROGRAM 7

Thursday Afternoon, December 28, 1:30 P.M.-5:30 P.M.
Essentially the same as Program 2.

PROGRAM 8

Thursday Evening, December 28, 7:00 P.M.-11:00 P.M.
Essentially the same as Program 3.

PROGRAM 9

Friday Morning, December 29, 9:00 A.M.-1:00 P.M.
Essentially the same as Program 4.

PROGRAM 10

Friday Afternoon, December 29, 1:30 P.M.-5:30 P.M.
Essentially the same as Program 5.

PROGRAM 11

Saturday Morning, December 30, 9:00 A.M.-1:00 P.M.
Essentially the same as Program 1.

PROGRAM 12

Saturday Afternoon, December 30, 1:30 P.M.-5:30 P.M.
Essentially the same as Program 6.

ANNUAL SCIENCE EXPOSITION

The AAAS Annual Science Exposition fills the entire Arena of the Cleveland Public Auditorium. The exhibit area, which is on the street level, is reached through the Lakeside Avenue entrances.

The ANNUAL SCIENCE EXPOSITION is open to:

1. All attending the 117th Meeting
2. All convening members of the National Business Teachers Association (who wear convention badges)
3. Members of the professions who have applied for, and received, complimentary admission tickets

The Exposition is *not* open to children. The evening of Thursday, December 28, has been set aside, primarily, for selected Cleveland high-school seniors who are science majors and who have special tickets. The regulations of the Auditorium provide for a metering of the attendance by doormen in uniform. Since admission is restricted to registrants and those who present complimentary admission tickets, PLEASE WEAR YOUR BADGE.

Hours of the Annual Science Exposition

Tuesday, Dec. 26
noon to 5:00 p.m. and 7:00 to 9:00 p.m.
Wednesday, Dec. 27
9:00 a.m. to 5:00 p.m. and 7:00 to 9:00 p.m.
Thursday, Dec. 28
9:00 a.m. to 5:00 p.m. and 7:00 to 9:00 p.m.
Friday, Dec. 29 9:00 a.m. to 6:00 p.m.
Saturday, Dec. 30 9:00 a.m. to 5:00 p.m.

Special Exhibits

1. THE ANNUAL INTERNATIONAL PHOTOGRAPHY-IN-SCIENCE SALON, sponsored by THE SCIENTIFIC MONTHLY and the Smithsonian Institution. The prize-winning entries and other photographs of the Fourth Annual International Photography-in-Science Salon—both color and black-and-white prints—will be on exhibition for the first time before going on a tour of museums and scientific institutions throughout the country. Aisle 400 and Lounge Area.

2. THE AMERICAN MUSEUM OF ATOMIC ENERGY, which is operated for the Atomic Energy Commission by the Oak Ridge Institute of Nuclear Studies. These exhibits will be near the stage and consist of 1) the American Chemical Society exhibit on atomic energy; 2) the Harrison S. Martland exhibit on radium dial workers; 3) a model of the Oak Ridge uranium-graphite nuclear reactor showing radioisotope production; and 4) a model of a nuclear energy power plant built by the Brookhaven National Laboratory according to a design proposed by the Monsanto Chemical Company.

3. THE CLEVELAND HEALTH MUSEUM, housed in a former mansion, is a science museum specializing in human biology and public and personal health. Incorporated in 1936, it opened its doors to the public in 1940. "The first in America," it tries to improve the health of the community through modern methods of visual education. The exhibit of the museum will depict 10 years of experience in community health education. Through the medium of the famous Dickinson-Belskie models on human reproduction, the museum places itself in the foreground of family life education. The museum's studios build exhibits for national as well as international organizations. Special educational activities include classes for expectant mothers, an annual pollen count, diabetes detection week, classes for occupational therapists, workshops on emotional health for teachers, and a dental poster contest. More than 400,000 people visited the museum during its first 10 years. Duplicates of its exhibits have been used in many museums and educational institutions in the United States and South America. Near the stage, on the right.

4. FENN COLLEGE. "Education in Action," the story of how the famous Fenn Plan of Cooperative Education contributes directly and indirectly to the advancement of science, is graphically told in the Fenn College exhibit. Highlighted are illustrative scenes and practices of the work-study plan. Pioneering in development and adaptation of cooperative education, the Fenn Plan alternates classroom and laboratory instruction with supervised periods of employment in business and industry. This year, for example, more than 500 students will work on scientific research and development projects during "co-op" work periods. Others will gain firsthand experience and understanding of the need for, and the practical application of, scientific development, in business and industry. Founded in 1881, Fenn College inaugurated its cooperative education program in 1923. This year more than 300 business and industrial concerns in Cleveland will employ Fenn "Co-op" students. With a School of En-

gineering, School of Business Administration, School of Arts and Sciences, and a Technical Institute. Fenn has 1,300 Day Division students and 3,000 Evening Division students. Its 2,500 alumni are successful examples of Fenn's contribution to the community—its business and industry. Near the stage, on the left.

5. SPECIAL LIBRARIES ASSOCIATION, CLEVELAND SECTION. The Cleveland Chapter of the Special Libraries Association has prepared an exhibit showing types of information its members can be called upon to give, professional publications of general interest to research workers, and new developments and techniques in handling literature research. Near the Lounge Area.

Directory of Exhibitors

(Descriptive material prepared by individual exhibitors)

All booths of the 100 series are on Aisle 100; all booths of the 200 series on Aisle 200, etc. As one enters any aisle from the lobby of the Auditorium, all odd-numbered booths are on the left; all even-numbered booths on the right. Booths 1, 2, and 3 are between the two entrances.

AAAS New Member Service—SCIENCE—THE SCIENTIFIC MONTHLY. (Booth 2—between the two front entrances from the lobby.) There are personal advantages in joining the Association. Every person in attendance at the 117th Meeting who is not a member of the AAAS is cordially invited to visit the New Member Service for information concerning the Association. Since its founding, in 1848, the Association has admitted to membership not only professional scientists but also other men and women who have a general interest in science, who wish to keep informed of the progress of science, and who would like to support the high purposes of the one organization that represents all science.

Included in the annual dues of \$6.50 (for 1951), each member has a choice of a year of *SCIENCE*, the professional scientist's newsweekly, or *THE SCIENTIFIC MONTHLY* (or both, for an additional \$3.50). Free sample copies of these two publications will be distributed, and all not familiar with both magazines are invited to visit this booth. *Prospective advertisers* may obtain sample copies of the magazines and rate cards. Members of the AAAS are requested to nominate fellow-scientists for membership.

Academic Press Inc. (Booth 429). Academic Press cordially invites you to visit its exhibit at Booth 429 and inspect the variety of titles which aid scientists in keeping abreast of all recent developments. Browsers will find the ever-growing "Advances" which have become well established and are published at regular intervals; they will note important treatises on "The Enzymes," "The Alkaloids," and "The Hormones." Texts and reference works such as *Plant Biochemistry*, by James Bonner, and *Chemistry and Biology of Proteins*, by Felix Haurowitz, will be on view, together with books in the fields of chemistry and physics. Photo-offset reproductions of publications exemplified by *Journal of Organic Chemistry* and *Journal of the American Chemical Society* indicate the scope of activities of the Johnson Reprint Corporation. A stop at Booth 429

will also acquaint members and friends of the AAAS with publications scheduled for the coming year.

Allis-Chalmers Manufacturing Company (Booths 111 and 113). A mechanical counterpart of the human kidney will be displayed by Allis-Chalmers Manufacturing Co., Milwaukee, Wis., at the meeting of the American Association for the Advancement of Science. Built of stainless steel, the machine is about 51½ inches long, 42 inches high, and 24 inches wide. It consists of a perforated drum which rotates and is partially submerged in a rinsing fluid containing primarily electrolytic salts. Both drum and bath are constructed of aluminum covered with a type of Vinylite. The drum is spiraled by about 140 feet of cellophane tubing through which the blood flows as the drum rotates. This tubing is actually sausage casing, which permits certain sized molecules to flow through its walls. As the blood travels through the tubing, passing along always below the level of the bath water, the poisons, because of their molecular size, seep through its walls into the rinsing fluid. Allis-Chalmers engineers based the kidney on work done by Dr. W. J. Kolff of Holland.

American Book Company (Booth 122). American Book Company, publishers of school and college textbooks, will have on display in Booth 122 a representative selection of its most recent publications in the field of science. The eighth edition of *Gray's Manual of Botany*, revised by Merritt Lyndon Fernald, is an outstanding feature of the exhibit. Publication of this latest revision of the authoritative book in the field for over a hundred years represents an event of major significance. Another important book on display will be Allan R. Day's *Electronic Mechanisms of Organic Reactions*—a text which embodies the results of investigations carried on during the past 25 years. *The Fundamentals of College Chemistry*, by G. Brooks King and William E. Caldwell, will be there, too. Many teachers have been quick to adopt this clear, concise text which emphasizes the important concepts. Another much-needed book on display will be *Experiments in Physical Chemistry*—an extremely practical new manual by Otto F. Steinbach and Cecil V. King.

American Cancer Society, Inc. (Booths 227 and 229). The exhibit of the American Cancer Society, New York City, is devoted to several different aspects of Cancer of the Lung. *Statistics:* Comparative statistics on relationship of lung cancer to all sites prior to 1900 to the present death rates of cancer of the lung in the U. S. A. compared by sex and by site. *Epidemiology:* Analysis of endogenous and exogenous factors and their causal relationship to cancer of the lung. *Diagnosis:* An outline of all current diagnostic procedures for cancer of the lung, with notes on their varying efficacy. *Treatment:* Indication for surgery—survival rates. (The indication for surgery, curative measures showing survival rates from pneumonectomy, and an outline of several palliative procedures.)

American Instrument Company, Inc. (Booth 312). Some of the most recent advances in instrumentation will be exhibited by the American Instrument Co., Silver Spring, Md. Among these is a new Light-Scattering

Microphotometer, capable of measuring 20 micro-micro lumens of scattered light. The instrument operates on 105-130 volts a.c. and can be used to measure scattered light at angles from 0° to 147°, these being read directly from a disk at the front of the instrument. A second feature of the exhibit will be the well-known Aminco-Stern Electrophoresis Apparatus. This complete electrophoresis laboratory occupies only 9 square feet of floor space and requires no installation. A new accessory to be shown with the apparatus is a rig used for the separation of components by adsorption chromatography. Other equipment to be shown will be the latest model of Rotary Warburg Apparatus, with a mechanism for stopping any of the manometers individually, an electrically heated micro Kjeldahl apparatus, the Coleman Spectrophotometer, and the MacBeth line-operated pH meter.

American Optical Company (Booths 126 and 128).

The Instrument Division of American Optical Company will display a new Reflecting Objective, valuable for studies in the infrared and ultraviolet bands of the spectrum. The new Photomicrographic Camera, designed for clinical applications, will also be shown. It has a 35-mm back for recording case histories in Kodachrome or black-and-white, and a 4"×5" back for cut film. The Scholar's Microscope, No. 78, with built-in light source, will be on display. It makes teaching easier because the students can see more with less effort. The new model #8 Phase Microscope; similar laboratory microscopes with and without Americote optics and attached illuminators; Polarizing Microscopes with Polaroid and Calcite prisms; a Vertical Illuminator for polarized light; Metallurgical and Stereoscopic Microscopes; Microtome; Refractometer; Spectrometer; Colorimeter; and Hb-Meter will also be shown, as well as an auditorium Delineascope and the ever-popular three-purpose MC 300 Delineascope. Representatives: J. P. Baker, J. J. Host, and W. L. Doemland will be in attendance to discuss any optical questions presented.

The American Tobacco Company, Incorporated (Booths 214 and 216).

The Research Laboratory of The American Tobacco Company will demonstrate a smoking machine especially designed to facilitate investigations of the properties of tobacco smoke. This machine simulates human smoking and makes possible a reproducible collection of smoke for analysis. Through basic research in this field, means have been found for the scientific selection of tobaccos and the control of quality in manufacture. Samples of the more important tobacco types, suitably labeled and described, will also be included in the exhibit.

Army Medical Library (Booths 414 and 416). The exhibit of the Army Medical Library, Surgeon General's Office, Department of the Army, is designed to show how the Army Medical Library can aid physicians all over the world. The Army Medical Library, which functions as the national medical library, contains over one million titles and receives more than 7,000 serials regularly. As guides to the literature, the library publishes the *Current List of Medical Literature*, a monthly index to 1,320 journals; the *Army Medical Library Author Catalog*, and annual catalogue of Books received by the

library; the *Index-Catalog*; and some minor publications. In order to make its collections available to those at a distance, the Army Medical Library provides free microfilm loans, lends books and journals to other libraries, and also answers questions and prepares bibliographies for those who have exhausted the resources of their local libraries. These services are furnished to the Armed Forces without charge; civilians are required to pay only for interlibrary loan postage and for any photostats or microfilm they wish to retain. The Army Medical Library was founded in 1836, but its greatest period of growth occurred after 1865, when John Shaw Billings was made librarian. Under his guidance the library grew from a few thousand volumes to a quarter of a million titles in the 1890s. The present collection has far outstripped its building, so that portions of the library are housed in three buildings in Washington and one building in Cleveland, Ohio.

Artisan Guild (Booth 409). Artisan Guild manufactures photographic laboratory processing equipment principally of stainless steel. As the title suggests, every product is built to be "Worthy of a Craftsman," yet sold at competitive prices. A stainless steel cabinet-type sink, fitted with developing processing units, for black-and-white film and color, trays, and negative and print washers will be displayed. We build special and standard equipment for various kinds of photo processing, including some motion-picture units, sinks of all types, some with temperature control units. Special hangers for round astronomical hangers for long record strips, and lantern slide carriers for use in standard or special tanks will be displayed. Scale miniature photo labs will be featured which will show various layouts for differing needs. Separate scale pieces will help those who wish suggestions for darkroom layouts. A competent person will be available to discuss special designs and equipment.

Association of American University Presses (Booth 220). See these University Presses books at Booth 220: A. N. Whitehead and Bertrand Russell, *Principia Mathematica*, set, \$30.00 (Cambridge); Nicholas Rashevsky, *Mathematical Biology of Social Behavior*, \$5.00 (Chicago); Leonard Karel and Elizabeth Spence, *A Dictionary of Antibiosis*, \$7.50 (Columbia); James Bryant Conant, Editor, *Robert Boyle's Experiments in Pneumatics*, \$9.00 (Harvard); James Franek and W. E. Loomis, *Photosynthesis in Plants*, \$7.00 (Iowa State); William Randolph Taylor, *Plants of Bikini and Other Northern Marshall Islands*, \$5.50 (Michigan); Ancel Keys et al., *The Biology of Human Starvation*, 2 volumes, \$24.00 (Minnesota); Schurr and Marschak for Cowles Commission, *Economic Aspects of Atomic Power*, \$6.00 (Princeton); Ernest S. Booth, *Birds of the West*, \$6.00 (Stanford); Leo A. Isaac, *Better Douglas Fir Forests from Better Seed*, \$1.00 (Washington); Robert Stauffer, *Science and Civilization*, \$2.50 (Wisconsin); George Gaylord Simpson, *The Meaning of Evolution*, \$3.75 (Yale).

Bausch & Lomb Optical Co. (Booths 321 and 323). All instruments exhibited will be set up for demonstration. They will include a number of items. Of special interest are the Wedge Interference Filter, Grating

Monochromator, Research Microscope, Monochromatic Colorimeter, and Student Microscope. The Wedge Interference Filter will be of special interest to anyone acquainted with the uses and production of colored light. The 250-mm Grating Monochromator produces monochromatic light and is especially designed for application in the ultraviolet region of the spectrum, its range extending from 200 to 1400 m μ . It will be set up with a Bausch & Lomb Research Microscope fitted with a quartz reflecting objective and condenser. The 2-in. square grating of the Monochromator has 15,000 lines per in. and, unlike older gratings, is blazed to produce maximum energy in the first order of ultraviolet light. Another new instrument to be demonstrated is the Colorimeter, a photoelectric type of instrument unique for its use of interference filters as standards. Biology and general science instructors should make a point of seeing the improved student Microscope. With a prefocusing gauge exclusive with Bausch & Lomb, it can be accurately focused on specimens by automatic means. In addition, many other instruments and products of special interest will be shown. Bausch & Lomb cordially invites you to see this demonstration and exhibit.

Bell & Howell Company (Booth 413). Bell & Howell Company, Chicago, Ill., manufacturers of precision-built photographic equipment since 1917, will have a display of its latest model 16-mm Filmsound projectors. There is a model for every purpose, from classroom to auditorium. Also on display will be 16-mm motion-picture cameras, silent projectors, time- and motion-study equipment, and the revolutionary Foton camera, capable of taking six pictures a second. It is fully automatic—just wind it up and push the button—the film transports the shutter cocks, and you are all set for the next shot. The Foton employs the latest and finest 2" Taylor-Hobson lens calibrated in T-stops.

Charles Beseler Company (Booth 134). The Charles Beseler Company will exhibit at this show two brand-new pieces of equipment. (1) The new Master Vu-Graph, covering a 10" \times 10" area for use in all sales meetings, permitting the speaker to face his audience as he unfolds his story and projects his large transparencies on the screen directly behind the speaker. It is widely used by industry and the Army, Navy, and Air Force. (2) A revolutionary new opaque projector which can be used in a partially lighted room, eliminating all light flashes, as well as the need for mounting opaque material, and equipped with an optical pointer. It is invaluable in sales meetings, or conferences where only one piece of copy is available and must be shown to a group.

Biological Abstracts (Booth 136). *Biological Abstracts*, a cooperative, nonprofit undertaking published by biologists themselves, affords the only means of keeping posted on the world's biological literature. Leaders in the field are agreed that it is an essential tool of biologists, both in teaching and in research. Currently abstracting more than 3,000 journals, the coverage has been expanded this year by upward of 30% and includes many European, Scandinavian, and Asiatic publications that are not available to the scientists of this country. As well as the complete edition covering all fields of

biology, *Biological Abstracts* also is published in nine low-priced sectional editions that were especially designed for individual biologists who are interested only in one or more closely related fields. These editions, as well as the complete edition, will be on display. The editor-in-chief and business manager will be in attendance to welcome visitors and furnish information. Stop at Booth 136 and let us show you how this publication has solved the problem of the high cost of printing.

Bioscope Manufacturing Co. (Booth 120). The Bioscope is an instrument designed primarily for classroom projection of microscopic material. It may either take the place of microscopes or simplify and speed up the use of microscopes. This instrument projects microscopic material downward on a table or on a wall screen, where a large group may study the subject and have particular parts actually pointed out to them. Because of the special arrangement of lenses, light, and heat filter, the Bioscope is ideal for the projection and study of living material. Absolutely no harmful heat will interfere, even though such material is studied for hours. The Bioscope is offered in response to a definite need and demand for more visual education in the science field and a speeding up of microscopic study.

The Blakiston Company (Booth 3). On your way to and from meetings, be sure to visit Blakiston's exhibit of new and standard textbooks and references. You'll be interested in Gibbs' *Botany*—uses the evolutionary approach; Rand's *The Chordates*—a comprehensive study of the basic structures common to all chordates; Bessey's *Fungi*—complete treatment of structure and classification; Rugh's *Embryology of the Frog*—a comprehensive study of a representative vertebrate; Braun's *Deciduous Forests of Eastern North America*—the only book of its kind; and Harrison's *Principles of Internal Medicine*—a new text which follows the modern trend in medical teaching by thoroughly integrating the preclinical sciences with clinical medicine. Check the newest "Recent Advances" books for your specialty. Our science editor, James B. Lackey, will be happy to discuss with you the most recent additions to our scientific line.

The Brush Development Company (Booth 204). The Brush Development Company will display at Booth 204 Industrial Instruments and Hypersonic Laboratory Equipment. The instruments to be shown are the d.c. Amplifier, the Strain Analyzer, the Uniformity Analyzer and the Heterodyne Voltmeter. The Uniformity Analyzer is an instrument designed for the measurement of almost any type of filamentary material, such as yarn roving and sliver. The instrument works on the dielectric constant principle. The record on the oscillograph chart indicates the nonuniformity of the material in weight per unit length. The Heterodyne Voltmeter was designed as a selective vacuum tube voltmeter for the measurement of higher frequency voltages employing the basic super-heterodyne principles, combining an untuned input circuit with an IF Amplifier of high gain and selectivity. The input voltage is indicated on one meter, and the modulation percentage is shown on another. This equipment is constructed for maximum sensitivity, suitable for the measurement of R.F. voltages in the μ v range.

Bussey Products Company (Booth 417). Bussey Products Company is fast becoming the largest producer of animal cages in the United States, and more researchers and scientists in leading laboratories all over the country are demanding their "Permweld"-constructed cages. Utilization of modern high-speed multiple welding units has enabled them to produce strong and rigid cages which are sanitary, light in weight, and long-wearing. With the assistance and advice of leading laboratory researchers, Bussey produces and stocks a line of cages that should meet every need of the modern laboratory. Their equipment is also supplied in stainless steel.

Cambridge Instrument Company, Inc. (Booth 410). The exhibit of the Cambridge Instrument Company, Inc., will be of interest to scientists in many fields, a number of the instruments exhibited being of comparatively recent development. In the medical field are shown this Company's "Simpli-Trol" (photographic) and "Simpli-Scribe" (direct-writing) portable electrocardiographs and a direct-reading Helium Analyzer for the determination of lung capacity. For measuring radioactive emission, Cambridge shows the Precision Ionization Meter, "Chang and Eng" Fast Neutron Monitor, and Pocket Gamma Dosimeter, as well as the Lindemann-Ryerson and Compton Electrometers. The exhibit also includes the Electron Ray Research pH Meter, a multi-purpose Surface Pyrometer, and the remarkable "Flik" Galvanometer having a period of 0.1 second. Of interest to microscopists is the Rocking Microtome for cutting sections as thin as 0.2 μ .

Cameron Heartometer Company (Booth 310). The Cameron Heartometer Company is showing for the first time the Cameron Heartometer, the Cardiorespirograph, and the Mercury Compensator. The Heartometer is a scientific precision instrument for graphing a permanent record of: a, systolic and diastolic blood pressures based on the auscultatory, sound criterion, method; b, the pulse rate; c, the force and form of the heart impulses; and d, the arterial changes throughout the extremities, as evidenced by graphs made from the brachial, radial, palmar, femoral, popliteal, tibial, and dorsalis pedis arteries.

The Cardiorespirograph shows on a linear graph the same data as afforded by the Heartometer, together with the respiratory rate and excursion in centimeters of water pressure. The Cameron Mercury Comparator (for the confirmation of blood pressure readings) projects the pulsations in the mercury column from the arm band onto a screen, enlarged at a ratio of 16:1. Movements of the mercury can be readily seen, thus providing a means of checking and proving blood pressure readings.

Carolina Biological Supply Company (Booth 406). The Carolina Biological Supply Company of Elon College, N. C., and Waubun Laboratories of Schriever, La., will be represented at the Annual Science Exposition by an attractive and interesting exhibit. The exhibit will include biological materials from the Culture, Slide, Preserved Materials, and other departments to illustrate the most up-to-date methods of cultivation of microorganisms, the preparation of microscope slides, and the preservation and injection of macroscopic specimens. Several proc-

esses will be completely demonstrated, thus serving to illustrate routine practices in our laboratories. A staff of professional biologists will be in charge of the exhibit and will offer a complete biological materials information service. Literature, including teaching aids, will be available free of charge to those viewing the exhibit. We extend a cordial invitation to all interested scientists to visit our booth.

Central Scientific Company (Booths 222 and 224). Cenco will exhibit new scientific instruments and apparatus for laboratories in Booths 222 and 224. One of the new items shown will be the Cenco-Friedemann-Liebeck Fluorimeter for measuring the transmittancies of fluorescent solutions in many analytical procedures. The display will include high vacuum pumps, an effective detergent of 8.2 pH for washing laboratory glassware, the new du Nouy Tensiometer, radioactivity meters and "sniffers," a plastic hemagglutination plate, an anthropometer, a new line of aluminum alloy laboratory clamps, etc. Visitors are cordially invited.

The Chemical Rubber Co. (Booth 212). In the booth of this company will be shown various pieces of laboratory equipment of interest to the research worker, the student, the teacher of science, and others interested in the latest developments in the field of science. The authoritative reference publication of this company, *The Handbook of Chemistry and Physics*, now in its 32d edition, will be on exhibit, as will the separately bound Mathematical Tables, reprinted from the *Handbook* for the use of students, research workers, mathematicians, and others whose work requires the use of logarithms, trigonometric functions, and other tabular data.

Church School Pictures, Inc. (Booth 231). We specialize in equipment for animated advertising. We will show two models of a device which uses 2" x 2" Kodachrome slides, illuminates and enlarges them, and keeps them moving continuously. The floor model has the trade name ADmatic—the table model has the trade name Sale-O-Matic. In both, a new picture comes onto the screen every 6 or 7 seconds, and after the series of 25 or 30 pictures has been shown the cycle starts over again and keeps going indefinitely. Another piece of equipment is an automatic 16-mm motion-picture projector which shows pictures continuously. This is known as a T.S.I. projector. In addition, we will show several styles of the Viewlex projector for showing filmstrips and slides. We will have the salesman's model which folds up into a carrying case, and also the large auditorium model for use in a group of 800-1,000 people. We will also show an automatic Sound View projector which has a record player combined with the filmstrip projector. With this device the picture advances automatically to synchronize with the story being told from the record. In addition we will have a Brush portable Soundmirror tape recorder. We will show a portable type arranged for a one-hour recording.

The Cleveland Electric Illuminating Company (Booth 123). The Cleveland Electric Illuminating Company will show how it promotes the Cleveland-Northeast Ohio area as "The Best Location in the Nation" at this year's Annual Science Exposition. At the company's exhibit,

representatives of its Development Department will distribute literature designed to attract industry to the area. They will explain how the company's development campaign sells the many superior advantages of the Cleveland-Northeast Ohio area to industry for production, distribution, and management headquarters. "The Best Location in the Nation" campaign is part of a continuing sales effort on the part of the Illuminating Company to help build business and create jobs for the people in the communities it serves. Since the war, this campaign has helped attract more than \$700,000,000 in private capital for investment in industrial expansion in the Cleveland-Northeast Ohio area.

The Cleveland Graphite Bronze Company (Booth 218). In our display at the Annual Science Exposition, we hope to show that the function of industry is to translate the laboratory achievements of the scientist into production of millions of pieces. We will have on display a selection of the most interesting sleeve bearings that we make for aircraft, automotive, and Diesel engines, along with three panels outlining the production process for representative babbitt, copper lead, and silver bearings; and a fourth panel showing typical causes of bearing failure and the relative susceptibility of the three types of material to each of these causes. Each of the panels will contain microphotographs of structure and charts reflecting technical data at the various stages of the manufacturing process.

Deering, Milliken Co., Inc. (Booth 133). "Milium" fabrics, sold through Deering, Milliken Co., of New York, are a new development of the textile industry. In the "Milium" process, a specially prepared resin notable for transparency to infrared radiation and containing highly reflective metallic flakes, is applied to a surface of the fabric and permanently bound there. This surface thus becomes an excellent reflector or, conversely, a poor emitter of radiant heat. Although the technique is applicable to all fabrics, only rayon linings are being so processed this year. The "Milium" lining is mounted in a garment with the treated surface away from the wearer. Being a poor emitter of radiant heat, it acts as an insulator and reduces heat losses from the body. "Milium" linings, without adding an ounce to the weight of the garment, thus provide greater warmth with a standard outer garment fabric than does an untreated lining plus a 9½-10 oz wool interlining with the same outer fabric, as measured on the standard warmth tester regularly used by United States Testing Company.

Denoyer-Geppert Company (Booth 437). Denoyer-Geppert Company will exhibit a full range of visual teaching aids for the biological sciences, including the new complete series of outstanding anatomy and physiology charts—the Kampmeier-Lariviere Anatomy Charts—and three-dimensional models for biology, of our own manufacture and of foreign make. Whether you are setting up a long-range program for equipping your classes with visual teaching aids or are selecting for immediate use, we shall be pleased to have the opportunity of serving you.

Eastman Kodak Company (Booths 110 and 112). On exhibit will be illustrations of the use of photography

in photomicrography, nuclear physics, and autoradiography. The use of the Kodak Fluorolite Enlarger A and accessories for photomicrography will also be demonstrated.

Eaton Manufacturing Company (Booth 210). The exhibit of Eaton Manufacturing Company's Central Research Division will feature the newly patented Magnefluid Clutch. This clutch, which uses a dry lubricant such as graphite, in combination with powdered iron, has wide applications in numerous industrial fields. Five operable units of this clutch will be on display. The central unit will be cutaway for the purpose of illustrating what happens to the powdered iron when the clutch is energized. Two units can be operated by the visitors. These units will have hand cranks and rheostats. As the electrical current is increased, it will become increasingly more difficult to turn the crank. These units will demonstrate the slight amount of current necessary to create considerable torque by the Magnefluid Clutches. The two additional operating units will illustrate two applications of the Magnefluid Clutch. One of these will consist of a unit driving an engine-cooling truck fan, and the other, a unit acting as a clutch on a textile winding machine. The side and back walls will be covered with schematic drawings which will illustrate various applications of the Magnefluid Clutch. In addition, the eleven advantages of this clutch over the standard clutch will be emphasized. Literature on the Magnefluid Clutch will also be available.

Encyclopaedia Britannica, Inc. (Booth 131). The first Encyclopaedia Britannica was published in 1768. George Washington bought the third edition (printed in the United States), and liked it so well he urged Alexander Hamilton to buy one, which he did—shortly before Burr killed him. Sir Walter Scott had a heavy interest in Encyclopaedia Britannica to the tune of 130,000 pounds around 1820. Encyclopaedia Britannica has always been regarded as an educational institution rather than a business venture; therefore, it is fitting that today the University of Chicago owns Encyclopaedia Britannica. Senator William Benton, of Connecticut, is Chairman of the Board. Under their auspices the 1950 edition (Mid-century), the latest revision, has been published, and will be shown at the Science Exposition. The Encyclopaedia Britannica in 24 volumes, with 38,000,000 words, 3,500 contributors, and edited by 200 persons, together with Annual Service, private Research Reports, and Study Guides will be explained at this exhibit. The Encyclopaedia Britannica is a tool of education and information, and, just like any other tool, must be properly used for maximum effectiveness.

Ercona Corporation—Carl Zeiss, Jena Products (Booths 431 and 433). Production facilities of the famous Carl Zeiss plant at Jena have been greatly expanded, and all instruments in the scientific instrument line are now again available in increased quantities. Their well-known high standard of precision workmanship has not only been maintained, but many improvements and entirely new designs have been introduced. For the first time in many years a representative selection of Carl Zeiss, Jena products will be displayed at the

Annual Science Exposition in Cleveland, by the new Zeiss agency in this country, Ereona Corporation of New York. Among other items this exhibit will include the new and most modern types of Zeiss research microscopes, such as the Lumipan with interchangeable binocular and monocular tubes, triple-condenser revolver, pancreatic condenser system, built-in illuminator, and phase contrast equipment, as well as the latest models of the L-series microscopes; the latest type refractometers, the new Circle-Polarimeter, Abbe Comparator, Laboratory Interferometer, Photomicrographic Equipment, a variety of instruments for industrial testing and measuring purposes, photographic equipment including the new Contax model S, binoculars, and surveying instruments.

Ferro Enamel Corporation (Booth 206). Ferro Enamel Corporation manufactures porcelains, enamels, furnaces, equipment, supplies, colors. The booth of Ferro Enamel Corporation will show how porcelain enamel finishes are produced. Porcelain enamel is glass applied to metal. There are two major steps in the production, which are the manufacture of the "frit," or basic ingredient, of porcelain enamel and the application of the enamel to steel. The two steps will be shown to visitors by means of demonstrations. Supplementing the demonstrations will be visual displays of the superiorities of today's porcelain enamels over those of ten years ago and also tests, giving witness to the improved qualities of modern porcelain enamels.

Gamma Scientific Company (Booth 102). Products to be displayed will include the Gamma line of Micro Manipulators for work at both high and low powers, the unique Promi projection microscope with built-in light source, Gamma portable pH Meters, and the latest models of Gamma Universal Photomicrographic Cameras. Among these will be the new type "U," the only camera of its kind to offer instantaneous changeover from 35-mm to larger size film or plates, and from low-power stage to microscope. Microscope, camera, and light source are combined in a sturdy unit which is always ready for operation and can be used by inexperienced operators without difficulties. A selection of research and student-type polarimeters, micro and semimicro balances, and the revolutionary Zeiss-Opton Stereo Microscope (also a Zeiss-Winkel Phase Microscope) will be shown.

General Biological Supply House, Incorporated (Booths 302 and 304). General Biological Supply House, Inc., will exhibit a wide range of teaching materials for the biological sciences. On display will be the dissectible rubber models of the Human Figure with Musculature, and the Female Torso, as well as models for Botany and Zoology. Microscope slides and Kodachrome lantern slides will be available, and for the first time the new series of Kodachrome Lantern slides for Human Histology will be on display for examination and projection. The exhibit will also include special skeletal preparations, anatomical dissections, and a wide variety of biology charts, plastic preparations, and laboratory equipment.

General Electric Company (Booths 325 and 327). The Lamp Department of General Electric Company, Nela Park, near Cleveland, has prepared an exhibit that tells

the story of American progress by dramatic comparisons of life in "the old days" with today's modern living. This story will point out General Electric's contribution to this progress and will emphasize our free enterprise system.

The General Tire and Rubber Company (Booths 127 and 129). On exhibition will be Jato units, developed and manufactured by General's Aerojet Division; new developments in mechanical rubber goods produced at General's Wabash and Logansport, Ind., plants; new plastic films produced at the Jeannette, Pa., plant; rubber-to-metal adhesives; and Hetro TT, a new kind of shoe sole. The exhibit will also illustrate the masterbatching principle which has made possible stronger, longer-lasting synthetic rubber products, and a new cord dip (which is now being used in the manufacture of General Tires) with extraordinary adhesive properties.

The Glidden Company (Booth 116). The Glidden booth will contain a graphic presentation of some of the principal scientific developments of the greater Glidden Company in the fields of foods, paints, chemicals and pigments, soya products, naval stores, livestock and poultry feeds, and powdered metals.

The B. F. Goodrich Company (Booths 115, 117, 119, and 121). The puncture-sealing tubeless tire, goal of automotive engineers for several decades, and the story of the American rubbers used in its manufacture will be features of The B. F. Goodrich Company exhibit. The company's exhibit will show some of the major contributions of science to the improvement in the performance of rubber, chemical, plastic and other products and materials manufactured by B. F. Goodrich. Other features of the company's exhibit include recent developments in the field of lactone research, the story of β -propiolactone, and a presentation of polyvinyl chloride developments. Another feature of the exhibit will be a picture visit to The B. F. Goodrich Company's new research center at Brecksville, Ohio, one of the world's most modern workshops of science.

The Goodyear Tire & Rubber Company, Inc. (Booths 326 and 328). The Goodyear Tire & Rubber Company will feature a production model of the Goodyear Electronic Analog Computer. This Computer determines the performance of dynamic systems by solving simultaneously a set of equations expressing the transfer functions of the network components. Electric analog computers find their chief use in the solution of problems arising in aircraft design and control, vibration analysis, industrial servomechanism controls, and internal-combustion engines, mechanical structures, and in other dynamic systems. Substantial savings in time result from the use of an analog computer instead of manual computations in the study and design of dynamic networks. The reduction in man-hours, which is about five to one if only one solution is required, increases to twenty-five or more to one if, as is usually the case, a number of solutions is needed. Goodyear men from Goodyear aircraft's technical staff will be in attendance for consultation and actual demonstration of the computers.

The Graf-Apsco Company (Booth 104). This exhibit will be devoted principally to rebuilt microscopes and

kindred items to demonstrate the Graf-Apsco slogan, "America's Leading Microscope Repair House." Models from the simplest to ultra research models will be exhibited, as well as new microscopes, microtomes, and microprojectors. Dissecting sets and instruments, magnifiers, microslides, cover glasses, etc., will also be exhibited.

Grune & Stratton, Inc. (Booth 125). Grune & Stratton again takes pleasure in exhibiting some outstanding titles, such as: Gillman and Gillman's *Perspective in Human Malnutrition*, Linksz's *Physiology of the Eye*, Volume I on "Optics," Rosenzweig's *Psychodiagnosis*, Sonnemann's *Handwriting Analysis*, Wolff's *Values and Personality*, Pascal and Suttell's *The Bender-Gestalt Test*, Storch's *Fundamentals of Fluoroscopy*, Veillon's *English-French-German Medical Dictionary*, Bauer's *Differential Diagnosis*, and many others. We invite you to see these titles in Booth 125.

Hamilton Bell Company, Inc. (Booth 124). Here professors will find the tools so much needed by students to do good dissecting. You will see all kinds of instruments for botany, zoology, anatomy, physiology, and histology. Whether your needs are for dissecting kits, or special scissors, scalpels, forceps, cover glasses, etc., we invite you to compare our quality and prices. The leaders in the field since 1910.

Harper & Brothers (Booth 435). On display at the Harper & Brothers booth will be all their standard text and reference books in the biological and physical sciences, as well as a selected list in the social sciences and medicine. Representatives of the College Department in attendance will also have advance proof or information about such forthcoming titles as Sarles, Fraser, Wilson, and Knight's *Microbiology: General and Applied*, Eaton's *Comparative Vertebrate Anatomy*, Ford and Beach's *Patterns of Sexual Behavior*, Murphy's *Introduction to Psychology*, Garrels' *A Textbook of Geology*, and Eardley's *Structural Geology of North America*. You are also invited to browse among the many new Harper books of general interest that will accompany the exhibit.

Harris-Seybold Company (Booth 135). The Harris-Seybold Exhibit: A working model of a cation exchange resin column will be shown producing high molecular weight arabic acid from gum arabic solution. The arabic acid is neutralized with ammonium hydroxide and sensitized to light with ammonium chromate. Dyes and other substances are added, and the coating is whirled on a grained zinc, or other metallic plate, and dried. The coated plate is then exposed to the light of a powerful arc lamp through a positive stencil and carried through various finishing steps, which will be shown by examples. The final deep-etch lithographic plate will be shown, and various samples of fine lithographic printing will be on display. Background display will be photographs of modern offset lithographic presses and other graphic arts equipment.

Harshaw Chemical Company (Booth 305). Harshaw Scientific, a Division of the Harshaw Chemical Company, will exhibit: Synthetic Optical Crystals; Analytical Balance; Micro Projector; Biological Photomicrographic

Equipment; Spectrophotometers; Research Microscopes; and Laboratory Specialties.

D. C. Heath and Company (Booth 130). On display will be both secondary and college books in science, mathematics, home economics, and related subjects. Among the college texts you will want to examine are: Fieser and Fieser, *Organic Chemistry* in a new second edition; McBain, *Colloid Science*, the most recent text in this subject; Boyd, *Genetics and the Races of Man*, an anthropology based on known gene frequencies; Oelke, *Semimicro Qualitative Analysis*, a brand-new book with outstanding features; Bendenhall, Eve, Keys, and Sutton *College Physics* in a new third edition, featuring a distinctive practical format; Dicken, *A Regional Economic Geography*, chosen as one of the fifty best-designed textbooks of 1949; the W. L. Hart *mathematics texts*; Snyder, *The Principles of Heredity*; Hopkins and Hopkins and Bailar *chemistries*; Duvall and Hill, and Becker and Hill *texts on marriage and the family*. Among the secondary school books you will find in this exhibit are: Harris and Henderson, *Food, Their Nutritive, Economic, and Social Values*, in a new second edition, called by some reviewers a miniature encyclopedia on foods; Brown and Schwachtgen, *Physics—The Story of Energy*, distinguished by its clarity of text and new organization; the W. W. Hart *mathematics texts*.

Hevi Duty Electric Company (Booth 307). "Exclusively Electric" furnaces and heating apparatus designed specifically for the modern scientist's laboratory will be displayed by the Hevi Duty Electric Company. A line of new and improved furnaces which are constructed according to the latest insulation and heating element designs will be one of the features of this exhibit. These furnaces were recently introduced to the scientific world for heating metals and alloys, annealing glassware, drying precipitates, ash determination, fusions, enameling, and heat treating metals. They are suitable for all laboratory heating operations that require temperatures from 300° F (149° C) to 2,600° F (1427° C). Representative models of the Hevi Duty line of combustion tube furnaces for all types of organic analysis, standard combustion, preheating gases, and carbon determinations will be displayed, as well as many other types of electric heating apparatus. Easily controllable, Multiple Unit Heating Elements, and special design features are combined in Hevi Duty electric equipment to provide greater economy, safety, and cleanliness.

Henry Holt and Company, Inc. (Booth 426). Henry Holt and Company, whose "American Science" Series was launched in 1874, is happy to participate in this 117th Meeting of the American Association for the Advancement of Science. One of our noteworthy texts in the field of botany this year is *College Botany*, by Harry Fuller (who will give the final address of the meeting at the close of the Exposition), and Oswald Tippo. Another important text is *General Chemistry*, by Pierce Selwood, who presents a thoroughly new and modern approach to the subject. On display at our booth will be many other significant texts in the fields of Astronomy, Biology, Mathematics, Physics, Botany, Chemistry, Geography, Anthropology, and Psychology.

Horizons Incorporated (Booth 424). Horizons Incorporated is a research company engaging in basic and applied research in the fields of physics, ceramics, metallurgy, and chemistry. In general, the company specializes in solid-state physics and the associated chemical, metallurgical, and ceramic problems. Organized in 1946 under the scientific direction of Eugene Wainer, Horizons has expanded its interests into fields that involve mechanical engineering and instrumentation. Its research laboratories are located at 2891 E. 79th St., Cleveland 4, Ohio; its business offices at 90 Nassau St. (First National Bank Bldg.), Princeton, N. J. The Horizons exhibit will in some measure indicate the scope of our interests and of our activities. The company will welcome visitors to our Cleveland laboratory; please make appointments for visits at Booth 424. Dr. Wainer, Dr. Sachs, Dr. Snoek, Dr. Steinberg, and other members of the laboratory staff will also be pleased to confer with interested people by appointment.

Houghton Mifflin Company (Booth 407). Houghton Mifflin Company will exhibit its extensive list of college texts in the fields of Biology, Chemistry, Economics, Mathematics, Physics, Sociology, Psychology, and General Science at the 117th meeting of the AAAS. Included with these college texts will be several trade books of general interest to science teachers.

Instruments Publishing Company, Inc. (Booth 309). Instruments Publishing Company will exhibit *The Handbook of Measurement and Control*, an informative digest of the new science of Instrumentation; *Instruments*, the Magazine of Measurement and Control; *The Instruments Index*, the Biannual Directory of the Instrument Industry; *The Instrument Maker*, the Trade Journal of the Instrument Industry; *The Instrument Maker Guide*, the Biannual Directory of the Parts Manufacturers for the Instrument Industry. Books: *Scientific and Industrial Glass Blowing and Laboratory Techniques*, by W. E. Barr and Victor J. Anhorn; *Elementary Engineering Electronics*, by Andrew W. Kramer; *Operation and Care of Circular-Scale Instruments*, by James Spencer; *The Engine Indicator—Its Design, Theory and Special Applications*, by K. J. DeJuhasz; *Heat Inertia in Problems of Automatic Control of Temperature*, by Victor Broda; *Applications of Industrial pH Controls*, by Allen L. Chaplin; *A Romance in Research—The Life of C. F. Burgess*, by A. McQueen, with a Technical Appendix by O. W. Storey. In attendance: Richard Rimbach, publisher; M. F. Behar, editor; C. F. Goldcamp, sales manager; Richard Rimbach, Jr., N. Y. manager.

Jack & Heintz Precision Industries, Inc. (Booth 412). While the end result of the combined use of many sciences will be found in the electrical products for aircraft displayed in the Jack & Heintz booth, there are also several behind-the-scenes developments not widely in use. The major products represent many of the latest developments in electrical equipment for aircraft, combining great power in small packages at extremely light relative weight with high dependability and long service life—but with safety the ever-predominant factor. An example is a new 500-amp, 30-v d.c. generator with 4,000–8,000 rpm speed range for use in mobile ground

power units for servicing aircraft. Historically, generators of such rating have weighed 250 pounds or more. This machine weighs less than 80 pounds. A few manufacturing helps can be talked about—perhaps a dynamic balancing material which adheres permanently but retains its pliability; or a method of bonding rubber to certain metals; or several other processes, all of which have helped to produce a more nearly perfect end product of electromechanical equipment.

The Kelley-Koett Manufacturing Co. (Booth 423). Three different types of sealers: Beta-Gamma Sealer Model K-281, a binary type featuring motor-driven reset and one-cord plug-in timer, Model K-214. Beta-Gamma Sealer Model K-275, a decade type featuring motor-driven reset and built-in timer. A parallel-plate Alpha Sealer will also be featured. Geiger Court-rate meters: Model K-800 battery-operated portable type. Model K-900 a.c.-operated laboratory type, featuring special connections and 3-way monitoring. Ion Chamber Survey Meters: K-350 Gamma Meter and K-351 Alpha Meter featuring scale-changing meter. K-352 Cutie Pie Alpha Meter. Miniature Gamma Detector Model K-550, pocket-sized GM tube instrument. K-803 Prospector, near pocket size. Personnel instruments: Dosimeters having ranges of 0.2, 5, 10, 50, and 100r, with new, compact charging unit (K-122). Condenser type chambers of various ranges and sizes, with a new charge reader (K-430) and accessories to adapt it for other uses (K-427 Probe). Quartz-fiber alpha-beta-gamma Survey Meter Model K-320.

Charles J. Lane Co. (Booth 317). A new line of improved Specimen Storage Cabinets featuring all-welded, verminproof construction will be exhibited in Booth 317. Products of the Charles J. Lane Company, New York City, these cabinets include Skin Cases for Ornithological and Zoological Specimens, Herbarium Cases for Botanical Specimens, and Entomological Cabinets. These heavy-gauge steel cabinets are manufactured in large quantities and in standardized sizes to assure low prices and prompt delivery. For the past two years, the Lane Herbarium Cases have been on the market and have been installed by many of the largest colleges and museums throughout the country. They have been well received and have met with the approval of all users.

E. Leitz, Inc. (Booths 217 and 219). E. Leitz, Inc., New York, will exhibit a wide range of microscope and photomicrographic equipment. The renowned Ortholux Research Microscope, with built-in illumination system, and the Panphot Universal Camera Microscope, with combination illumination system, will be displayed. Photomicrographic equipment will include the Aristophot, with $3\frac{1}{4} \times 4\frac{1}{4}$ camera for either micro or macro photography, and the Leica Camera. Other units for photomicrography are the MA-IVb for $3\frac{1}{4} \times 4\frac{1}{4}$ film or plate size, and the Makam Camera Attachment. The Micro-Ibso Attachment for photomicrography with the Leica Camera should be of great interest. Other microscope equipment will include the Leitz Ultropak for rapid tissue diagnosis in incident light at all magnifications. Also displayed will be a full line of biological microscopes for all types of investigation; the Leitz Micro-Projectors XI-c

and Xb-2; stereoscopic magnifiers; laboratory microscopes; and Leica Camera accessories.

The Linguaphone Institute (Booth 405). *Linguaphone!* The magic word which opens the door to any part of the world that interests you. *Linguaphone for languages!* All your knowledge and interest regarding any particular region in the world would have feeble results unless supplemented by a knowledge of the language spoken there. The Linguaphone Institute invites you to Booth 405 for a free demonstration—to find out for yourself the ease and pleasure with which another language can be acquired in your own home. There are 30 language courses from which to choose—each one consisting of a series of records and books—synchronized and recorded by some of the most famous speakers and educators in the world. But enough said—we look forward to seeing you!

J. B. Lippincott Company (Booth 201). J. B. Lippincott Company will present an interesting and active exhibit of professional publishing. With the "pulse of practice" centering in an advisory editorial board of active clinicians who constantly review the field, current and coming trends in medicine and surgery are known continually. On the studied recommendations of these medical leaders, Lippincott Selected Professional Books are undertaken. It is upon their knowledge too, of the outstanding work being done in general practice, as well as the specialties, that men making a very real contribution to medical progress are chosen to write the Lippincott books.

The Macmillan Company (Booths 203 and 205). The book exhibit sponsored by the Macmillan Company at the December 1950 meeting will consist of approximately 800 titles. In addition to undergraduate and graduate textbooks and reference works, there will be a large number of technical and scientific books of interest to the general reader. Books in the fields of various hobbies and avocations—photography, gardening, radio, outdoor life, and others—are represented, as are books of special interest to young readers. The major classifications are Agriculture, the Biological Sciences, Chemistry, Engineering, History and Philosophy of Science, Home Economics, Mathematics, Medical Science, and Physics. Boyd T. Harris, science editor, together with other members of the college department, will represent The Macmillan Company at this exhibit.

McGraw-Hill Book Company, Inc. (Booths 107 and 109). The McGraw-Hill Book Company will exhibit its usual wide selection of new and standard textbooks and reference works in all fields of natural and physical science and in many fields of technology, social science, and education. A considerable number of trade books of general interest will be displayed. Among the important 1950 publications to be shown will be: *Plant Pathology*, by J. C. Walker; *Functional Anatomy of the Vertebrates*, by B. T. Quiring; the fourth edition of *Principles of Genetics*, by Sinnott, Dunn, and Dobzhansky, and several recent volumes of the "National Nuclear Energy Series." The McGraw-Hill edition of the official U. S. government publication, *The Effects of Atomic Weapons*,

will be on display, and page proof of the notable *Human Physiology* of Bernardo Houssay will be available. Several representatives of the McGraw-Hill College Department will be in attendance, including H. W. Handsfield, science editor.

Merck & Co., Inc. (Booths 223 and 225). *Cortisone:* An exhibit consisting of panels carrying charts, diagrams, photographs, photomicrographs, and text presenting the biochemical relationships and the pharmacologic and physiologic actions of cortisone (Kendall's compound E), together with a summary of its therapeutic indications.

G. & C. Merriam Company (Booth 202). The G. & C. Merriam Company exhibit will consist of a sample display of the various publications of the company, which we list herewith: *Webster's New International Dictionary*, second edition, *Webster's New Collegiate Dictionary*, *Webster's Dictionary of Synonyms*, *Webster's Biographical Dictionary*, *Webster's Geographical Dictionary*, *A Pronouncing Dictionary of American English*, and *Picturesque Word Origins*. In addition, there will be displayed for distribution copies of various pamphlet material dealing with instruction in and the use of the various books mentioned above. Souvenirs will be provided.

The Microcard Corporation (Booth 132). The Microcard Corporation of La Crosse, Wisconsin, will exhibit microcards and microcard readers on tables. A Microcard is a standard-size catalogue card, measuring $7\frac{1}{2} \times 12\frac{1}{2}$ cm, or approximately 3×5 in. At the top is the descriptive material that customarily makes up a catalogue entry. In the upper left-hand corner is the Dewey Decimal number (used by most public libraries), and the Library of Congress number is in the upper right. Subject, author, and title appear at different points at the top in large print. The card can, therefore, be filed in any of these five ways. Below the catalogue entries appears the book itself in microscopic print. To read the book the card is inserted in the card holder of the Micro Library Reader, the light is turned on, and the pages "turned" by the knobs. The focus knob is used to bring the print to its maximum clarity. Many books and pamphlets are short enough to appear on one card, but longer books require two or more. A single card item will read "Card 1-all" and a multiple card item will carry such a note as "Card 2 (of 6)—p. 96-168." Microcards have four main advantages for libraries. They are a great space saver. A whole bookcase full of books can be housed in half a catalogue drawer. They stretch the book budget. One twenty-cent card may replace a rare item that would cost \$100 or more in the original. They save cataloguing costs, since catalogue copy and classification numbers are a part of the card. And, finally, they save the cost of binding and rebinding. The Micro Library Reader, Model No. 3, costs about as much as a typewriter and much less than a good microfilm reader. It is light and easily portable. It works on either a.c. or d.c. current. Microcards have many advantages over microfilm. Dropping the card into the card holder is far easier and quicker than attaching a roll of film, and it is not necessary to reel through many feet of film to find the item you want. Microcards are easy to file, to find, and to read. Micro Library Readers are made by the

Northern Engraving & Manufacturing Company, La Crosse, Wisconsin.

Philip Morris & Co., Ltd., Inc. (Booth 322). Physiologic and pharmacologic methods are used for evaluation of the irritants in cigarette smoke. It has been shown that the irritation-free cigarette smoke is influenced primarily by the type of hygroscopic agent used. Certain hygroscopic agents apparently add to the irritants from the tobacco itself, whereas diethylene glycol does not add to the irritation. The exhibit gives a brief description of some of the techniques involved.

The C. V. Mosby Company (Booth 301). The C. V. Mosby Company extends to all its friends in the American Association for the Advancement of Science the Season's Greetings. Those attending this year's convention are cordially invited to visit Booth 301, where a diversified selection of teaching texts for your classes and reference books for your library will be available for examination. In addition, our representatives will welcome an opportunity to bring to your attention the new material already planned for publication in 1951. However, whether you wish to browse, talk shop, or just say hello, we shall be happy to have you come by. Our exhibit is intended for you.

National Geographic Society (Booths 306 and 308). The exhibit of the National Geographic Society will feature the display of a selection of natural color slides by automatic projector. The slides cover National Geographic expeditions and were selected from illustrations by staff photographers of the *National Geographic Magazine*.

The National Screw & Manufacturing Co. (Booth 208). "Better Fasteners, too . . . thru Research." The *National Screw & Mfg. Co.*, Cleveland, features improved headed and threaded fastenings developed through scientific and technological research, to meet general or specific problems encountered in the assembly of all types of products with fasteners. Shown are Lok-Thred, an important modification of the standard American National screw thread and a self-locking design adaptable to all thread fastener forms; Hi-Shear Rivets, for reduced fastener weight and increased strength in shear; Place Bolts, with the unique diaphragm head design that gives extraordinarily high vibration resistance, and several forms of Lock Nuts, including the Drake for withstanding severe shock and vibration, the Dynamic for low clearance and severe shear strain application, the Huglock that maintains locking whether or not seated, and the Marsden, free-running until seated.

National Spectrographic Laboratories, Inc., and Jarrell-Ash Company (Booths 101 and 103). National Spectrographic Laboratories, Inc., and Jarrell-Ash Company are planning to exhibit optical and electronic equipment applicable to the biological, medical, and metallurgical field. This display will include such items as prism and grating spectrographs designed for analyzing materials for their chemical content, and high-powered electric source units. We plan to introduce an ultraviolet microspectrophotometer as well as a Pamphot Universal Microscope and Camera. We will also have on display a group of samples that will be representative of the type that we

have been handling in our consulting laboratory. These will include such items as leaves from fruit trees, tomato fruit, and other biological materials. Our companies are in a position to assist you with your laboratory equipment needs and also have available a staff of consultants who will be glad to discuss any of your problems in detail. They will arrange for you to visit the National Spectrographic Laboratories at any time convenient to you. The Jarrell-Ash Company will be represented by R. F. Jarrell, R. E. Ashley, and others, and the National Spectrographic Laboratories will be represented by H. M. Bedell, D. R. Moore, and other members of the company.

Nuclear Instrument & Chemical Corporation (Booth 303). The Nuclear display will show all of the Nuclear equipment in its new design as it will be found in the 1951 catalogue of the company. This includes the specialized instruments which this company has designed for use in almost every branch of radioactivity measurement and research. Medical equipment includes a scintillation counter and complete electronic equipment, including Isotron 11, used in brain tumor detection, as well as other laboratory-type instruments. Special instruments for classroom teaching purposes will be of interest to teaching personnel. Operating demonstrations of all types of instruments will be shown, and pocket size and portable dosimeters and radioactivity monitors will be on display.

Nutritional Biochemicals Corporation (Booth 401). The exhibit of Nutritional Biochemicals Corporation, Cleveland, will feature a number of NBCo Research Biochemicals of interest in various investigative fields. The world's most complete commercial selection of 75 Crystalline Amino Acids will be featured, together with 40 Nucleo-proteins, Purines, Pyrimidines, and derivatives. Also of unusual interest will be a display of 12 interesting Accessory Growth Factor Analogs, NBCo "Vitamin Free" Casein, and "Vitamin Free" Casein Hydrolysate. Technical representatives at the booth will be pleased to discuss any of our nearly 500 Research Biochemicals.

Oxford University Press, Inc. (Booth 419). Internationally famous for the quality of their format, for their meticulous editing, and for their contributions to scientific and medical progress, the publications bearing the imprint of the Clarendon Press, Oxford, and of Oxford Medical Publications, have set a high standard in their fields. The distinguished roster of authors includes in pure and applied science such names as R. C. Tolman, P. A. M. Dirac, George Gamow, and N. F. Mott; and in medicine, Sir Howard Florey, J. H. Burn, Siegfried Thannhauser, and John Fulton. The work of these and many others will be represented in the Oxford University Press exhibit.

Philosophical Library (Booth 408). The Philosophical Library will display some of the most recent publications in the field of science. The feature will be books by five of their list of Nobel Prize winners. Leading with Albert Einstein's *Out of My Later Years* and *The World as I See It*, the Philosophical Library will exhibit Irving Langmuir: *Phenomena, Atoms and Molecules*; P. W. Bridgman: *Reflections of a Physicist*; Max Planck: *Scientific Autobiography*; C. V. Raman: *The New Physics*. Among the other new books to be shown are Griffith

Taylor: *Geography in the Twentieth Century*; the Autobiography of Sir Arthur Keith; Dagobert D. Runes: *The Hebrew Impact on Western Civilization*; Arthur Rais-trick: *Quakers in Science and Industry*; and George San-tayana: *Atoms of Thought*.

Phipps & Bird, Inc. (Booth 114). Twenty-five years ago Phipps & Bird started in Richmond, Va. During this period they have continuously worked to produce instru-ments of the utmost superiority in quality. Their de-velopments have been aimed not only at the researcher but at the educator as well. You will find that they have on display an excellent cross section of products. These include the most modern instruments and pre-cision tools for biophysics. Skilled personnel, plus mod-ern shop and equipment, bring you these products not only at an economical cost but also for immediate delivery. In an effort better to serve you, their representatives, Hamp-ton Rexrode and Bob Smith will welcome suggestions as to instruments you would like to see them manufacture.

Precision Metalsmiths, Inc. (Booths 330 and 332). Presenting the first exhibit of its kind before the AAAES, Precision Metalsmiths, Inc., Cleveland, will visibly demon-strate how science and industry work as a team in the ever-progressive development of our "lost wax" method of quantity manufacture of small and intricate metal parts to the most exacting structural and dimensional requirements. Many parts—some of high military re-striction—are impossible of production by any other exist-ing process. The major sciences of physics, metallurgy, chemistry, electricity, and others all are combined in the engineering know-how our concern exhibits in effecting amazing economies in production which have made Pre-cision Metalsmiths the leaders in the field of precision investment metalcasting. Visitors to our exhibit will see actual and basic wax patterns made in production from ingenious dies and molds. Detailed explanation of other highly developed phases of our ultramodern process in more than 100 especially fitted alloys will be given by our experts, and questions are cordially invited.

Prentice-Hall, Inc. (Booth 1). Visitors to the Annual Science Exposition are cordially invited to examine the texts on display at the Prentice-Hall exhibit. Among the books to be exhibited will be the following new titles: *Chemical Thermodynamics*, by Irving M. Klotz; *Intro-ductory Quantitative Analysis*, by E. H. Swift; *Quantum Theory*, by David H. Bohm; and *Fundamentals of Quan-tum Mechanics*, by Enrico Persico. In addition many standard texts, such as *Organic Chemistry*, by Ray Q. Brewster, will be displayed.

Radiation Counter Laboratories, Inc. (Booth 105). Radiation Counter Laboratories, Inc., is a scientific lab-oratory devoted to making tools for the scientists using radioisotopes. Geiger counters, proportional counters, scaling circuits, nucleometers, linear amplifiers, special cosmic ray anticoincidence circuits, health instruments, microchemical glassware, scintillation crystals, sheet mica, specialized chemicals and special protective devices are all manufactured by this laboratory out of the finest com-ponents available. If you have special problems in this field our very competent group of physicists, chemists, electronic engineers, glassblowers, and technicians is at

your service. The main laboratories are located in Chicago, but some 25 authorized service stations for elec-tronic equipment are located in principal cities of this country and Canada. We shall be pleased to work with you in your research.

Radio Corporation of America (Booths 314, 316, 318, and 320). Radio Corporation of America will present a display of Scientific Instruments, Audio Visual Equip-ment, Industrial Television, Test Equipment, and Electron Tubes.

The Scientific Instruments display will be highlighted by the new table model electron microscope. Standing only 30" high, this "little giant" is 20 times as powerful as the light microscope. By means of a built-in camera pictures may be taken of specimens, which can be en-larged to as much as 40,000 diameters. The instru-ment will be a complete working model into which speci-mens will be inserted to be seen by visitors at magnifica-tions of several thousand diameters. There will also be a display of electron micrographs showing various viruses never before seen by the eyes of man, and other interest-ing specimens, including an actual picture of a molecule.

The Audio Visual display will center around the RCA "400" 16-mm motion-picture projector. This display will also be a working one, in which the salient features of the equipment will be demonstrated. Both the Senior and the Junior models will be shown. The culmination of 20 years of experience—since RCA first successfully made and reproduced sound on 16-mm film—will be por-trayed by projection of sound films.

The Industrial Television exhibit will comprise a work-ing demonstration of a miniature TV camera, which is no larger than a 16-mm movie camera. This equipment is especially designed for use in places where the human eye cannot be used to control an operation or process, and in cases in which it is desired to have an object or op-eration viewed by additional persons. An example of this latter application will be demonstrated. The Industrial TV Camera will be mounted on a light microscope directly above the eyepiece to view the specimen, and the camera will be hooked up to a 16-inch TV receiver on which will be seen greatly enlarged images of "bugs" moving about on the surface of the screen. Also, a standard 7-inch Industrial TV Monitor will be hooked up with a sec-ond TV camera so that the visitor can view himself and the surroundings, and can examine the clarity and con-trast obtained with the equipment. He may also operate the knobs on the monitor, which remotely control the beam intensity, electronic focus, and optical focus.

The Tube Department display will center around a TV Dynamic Demonstrator. This device shows, by means of actual parts fastened to the background, a working dem-onstration of TV receiver principles. The circuit will also be visible on the front of the display. The demon-strator will take a picture off the air to produce it on the face of the TV tube. The various components of a TV system can be seen by the visitors on the face of the demonstrator panel, and the relationship of each com-ponent to the other can clearly be discerned. Thus, the principle of operation from reception of signal to the dis-play of picture can be easily understood.

Ralston Purina Company (Booth 415). The Ralston Purina Company booth will introduce you to the Purina Research Laboratory. The Laboratory Building will be represented in a large full-color photograph. In addition there will be pictures of some of Purina's research personnel at work in the laboratory. In the Purina Research Laboratory are 35 individual laboratory units engaged in research in human foods, animal feeds, sanitation products, agricultural chemicals, and farm supplies. In addition to analytical, organic, and inorganic laboratories, the building houses modern cereal laboratories and complete biological units with capacities for 2,500 chicks and poults, 50 dogs and 500 rats per year, as well as hamsters, mice, guinea pigs, and rabbits. These units are used for basic research in the fundamental requirements of animals and for investigations on new theories and ingredients which may become integral parts of the company's products. Biological and animal assays of feed ingredients used are also made for their feeding value before being used in the finished products. Other facilities include fully equipped laboratories for research in the fields of disease and parasite control, agricultural chemicals, and farm supplies. The Purina Research Laboratories you will see depicted in Booth 415 have played a large part in the company's pioneering of applying new discoveries in nutrition and in making them available in a practical and usable form for feeders.

The Rayoscope Co. (Booth 403). The Rayoscope Co. of Delaware, Ohio, will display the latest improved model of the Rayoscope, a Microprojector. This new model has been designed with specific uses in mind such as metallography, petrography, and many other uses. The Rayoscope can be fitted to your specific needs in the various fields of science. The advanced model Rayoscope has all the refinements of a high-grade microscope and as such can be of inestimable value to anyone who ordinarily uses a microscope. We shall be pleased to see you at the Rayoscope booth.

Remington Rand Inc. (Booths 207, 209, 211, 213, and 215). A history-making demonstration of the new "Univac," or "electronic brain," will be part of the exhibit of Remington Rand Inc. The Univac will not be demonstrated in its entirety because of limitations of space. However, the "mercury memory tube," an internal register that retains as many as 1,200 "memories" at one time, will be shown in connection with a modified replica of the "Univac" itself. The "mercury memory" is a new development in electronics. The "Univac," created by two University of Pennsylvania scientists, John W. Mauchly and J. Prosper Eckert, and now owned by Remington Rand Inc., is a development of the original "Binac," an electronic giant. The Univac can solve any mathematical problem in a fraction of the time required by human calculators. It adds, subtracts, multiplies, and divides at incredible speeds, sorts and collates information, applies alphabetical entries, and performs logical operations. In addition to the Univac, Remington Rand Inc. plans to demonstrate other historic innovations which are products developed at the Remington Rand Laboratory at Norwalk, Conn.

Research Report, Inc. (Booth 428). *Research Report* is a new fortnightly journal of scientific research designed to relieve the pressure upon existing scientific publications by providing a medium in which brief articles may be published without delay. The major objective of the new journal will be to report new discoveries promptly; it also can serve as a medium for the discussion of published work. The social sciences will not be excluded; articles of special concern to scientists, other than those reporting upon research, will be placed on the last pages of the journal. Unique characteristics: Articles limited to 1,000 words printed on one side of a single page; inner edge perforated to facilitate easy removal; authors assessed \$10 for each article, enabling the journal to expand as necessary to provide "immediate" publication; no board of review—articles written or sponsored by "research members" of professional scientific societies. Subscription rate not to exceed \$4.00; publication date, early 1951; contributions invited. Editor, Ware Cattell. Address: Research Report, 1516 H St., N.W., Washington 5, D. C.

Richard Rimbach Associates (Booth 311).

Rinehart & Company, Inc. (Booth 421). Rinehart & Company, Inc., publishers, will be represented by a display of new, recent, and classic texts in chemistry, physics, mathematics, psychology, education, and anthropology. Visitors to Booth 421 may examine a number of texts published since last year's AAAS meeting, including: *Secondary Education: Basic Principles and Practices*, by William M. Alexander and J. Galen Saylor; *A History of Education: Socrates to Montessori*, by Luella Cole; *Teaching Social Studies in the Elementary School*, by Ralph C. Preston; a revision of *Northeast's Plane and Spherical Trigonometry*; *Selected Readings in Social Psychology*, by Stuart Henderson Britt; *Experimental Design in Psychological Research*, by Allen Edwards; and *A Handbook of Applied Psychology*, by Douglas H. Fryer and Edwin R. Henry. This last is an impressive two-volume work containing articles by more than one hundred applied psychologists. The display also includes a number of technical and radio books published under the imprint of Murray Hill Books, Inc., a subsidiary of Rinehart. Visitors are cordially invited to examine these books at Booth 421.

The Ronald Press Company (Booth 138). Representatives of The Ronald Press Company will be on hand to welcome visitors to its booth in the Annual Science Exposition. The display will include a varied selection of books on the biological and physical sciences, mathematics, engineering, psychology, and related fields. Information about important publications to be issued during 1951 will be available.

W. B. Saunders Company (Booth 402). You are cordially invited to visit Booth 402, where you will find on display publications of the W. B. Saunders Company, Philadelphia, in the fields of the biological sciences, chemistry, hygiene and health, and medicine. The books on display include *Comparative Animal Physiology*, by Prosser, Bishop, Brown, Jahn, and Wulff; Anson's *Atlas of Human Anatomy, Biology: The Human Approach*, by Claude A. Villee; *The Vertebrate Body*, by Alfred S.

Romer, *College Zoology*, by Hunter and Hunter; *Principles of Animal Ecology*, by Allee, Emerson, O. Park, T. Park, and Schmidt; *General Endocrinology*, by C. Donnell Turner; *Fundamentals of Bacteriology*, by Martin Frobisher, Jr.; *Principles of Organic Chemistry*, by John Leo Abernethy; *Quantitative Chemical Analysis*, by Clark, Nash, and Fischer; *A Textbook of Biochemistry*, by Benjamin Harrow; *Kinesiology*, by Katharine F. Wells; *Personal and Community Hygiene Applied*, by Williams and Wetherill—and many other titles. Saunders' representatives present will be Tyler Buchenau, James B. Finn, Jr., Paul E. Koerfer and E. R. Zieber.

The Science Library (Booths 313 and 315). The Science Library is administered by the AAAS as an additional service to publishers of books, both exhibitors and nonexhibitors. It has become an integral part of each year's Annual Science Exposition. In the Science Library, books of all publishers participating are grouped by fields of science—a convenience both to the visitor who is restricting his inspection of books to a single category, and to the one who wishes to browse. Among the publishers represented are:

ACTA ENDOCRINOLOGICA, INC.
ADDISON-WESLEY PRESS, INC.
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
ANNUAL REVIEWS, INC.
APPLETON-CENTURY-CROFTS, INC.
BASIC BOOKS, INC.
THE BLAKISTON COMPANY
CHRONICA BOTANICA CO.
COLUMBIA UNIVERSITY PRESS
COMSTOCK PUBLISHING CO., INC.
CRANBROOK INSTITUTE OF SCIENCE
THOMAS Y. CROWELL COMPANY
E. P. DUTTON & CO., INC.
EMERSON BOOKS, INC.
W. H. FREEMAN AND COMPANY
HAFNER PUBLISHING COMPANY
HARPER & BROTHERS
HARVARD UNIVERSITY PRESS
D. C. HEATH AND COMPANY
HENRY HOLT AND COMPANY, INC.
INTERNATIONAL PUBLISHERS CO., INC.
INTERSCIENCE PUBLISHERS, INC.
LEA & FEBIGER
J. B. LIPPINCOTT COMPANY
LITTLE, BROWN & COMPANY
LONGMANS, GREEN & CO., INC.
LOTHROP, LEE & SHEPARD CO., INC.
THE C. V. MOSBY COMPANY
PITMAN PUBLISHING CORPORATION
RAND-MCNALLY & COMPANY
REINHOLD PUBLISHING CORPORATION
HENRY SCHUMAN, INC.
CHARLES C THOMAS, PUBLISHER
UNIVERSITY OF MINNESOTA PRESS
UNIVERSITY OF NEW MEXICO PRESS
UNIVERSITY OF PENNSYLVANIA PRESS

UNIVERSITY OF WISCONSIN PRESS
YALE UNIVERSITY PRESS
THE YEAR BOOK PUBLISHERS, INC.

A portion of the Science Library has been reserved for *Proceedings* and other publications of the state academies of science affiliated with the AAAS.

The Science Press (Booth 118). The Science Press exhibit will emphasize new developments in printing as a result of research done in typewriter composition to be used either by offset or by letterpress reproduction. In this exhibit we shall exhibit samples of the different kinds of work showing how the procedure is accomplished and possible savings effected. There will be a Vari-Type machine operating in our booth. We will show how this machine works and how it contributes to the reduction in costs. There will be an attendant from the Cleveland office of the Vari-Typer company who will help explain the workings of the machine. Those in attendance from the office of The Science Press will be Mr. and Mrs. Jacques Cattell, who will be able to discuss printing problems with editors and publishers. *American Men of Science* will also be exhibited. Those who have changed their positions and addresses since the last edition of the directory should leave that change with the attendant at our booth.

The Standard Oil Company of Ohio (Booth 137). *Stroboscopic Automobile Engine Studies:* A demonstration illustrating one of the techniques used by Sohio research engineers to observe the flow behavior and distribution of lubricants on engine parts while they are in motion. By the use of a 100-hp V-8 engine taken from a 1950 automobile, operations of the cylinders can be observed as they would be operating normally in an automobile. This demonstration shows how, under normal driving conditions, a small amount of oil works its way from the oil pan along the cylinder walls, past the piston rings, and into the combustion chamber. To more closely study the way in which this action occurs, a stroboscopic study is made so that the moving engine parts are made to appear in slow motion or stopped altogether. It is through studies such as these that Sohio's research engineers can learn what types of lubricants do the best possible job. The resulting developments give longer life to your car and aid in better performance.

Staples Press, Inc. (Booth 411). Scientists attending the Annual Science Exposition will find Booth 411 an interesting exhibit sponsored by Staples Press, Inc., international publishers, of British Technical Books published during 1950. This exhibit comprises books from all the leading British technical and scientific book publishers. Orders may be given at the booth for books on the following subjects: Aeronautics, Anthropology, Astronomy, Biological Sciences, Chemistry, Geology and Geography, History and Science, Medical Science, Physics, and Psychology. Books may be examined and catalogues and literature will be available free during the exhibit. Because of the world-wide service of Staples Press, Inc., any technical book published outside the U. S. may be ordered at the booth.

Thompson Products, Inc. (Booths 418, 420, and 422). Thompson Products, Inc., Cleveland, Ohio, one of the

country's largest manufacturers of automotive and aircraft parts, will display turbo-jet aircraft engine components, such as turbine wheels, nozzle diaphragms, stator and rotor compressors, and jet blades and buckets. Shown also will be fuel and other aircraft pumps and many different precision parts the company produces for piston-type aircraft engines. The exhibit will include the turbine wheel and shaft from the General Electric J-47 turbo-jet engine, used in the U. S. Air Force "Sabre" fighter plane that set the world's speed record of 670.981 mph at Muroc Air Base. Borrowed from the Thompson automotive and aviation museum in Cleveland will be a collection of sodium-cooled valves, all produced by the company, taken from the engines of planes that made history during the early days of flying.

Tinnerman Products, Inc. (Booths 226 and 228). Principal forms of the Speed Nut type of fasteners, which have greatly shortened numerous operations in many industries, will be exhibited by Tinnerman Products, Inc., of Cleveland. The exhibit will include the basic type of Speed Nut which A. H. Tinnerman, president of the company, developed in 1925 to hold stove panels in place by spring tension. It consists of an arched strip of spring steel with two arched prongs formed to engage the screw threads. From this fundamental type, more than 5,000 types and sizes of Tinnerman Speed Nuts, Speed Clips, and Speed Clamps have been developed and used in industry. Among the variations of the basic type are W-shaped Speed Nuts, which are basically the flat type, curved upward at the ends and used whenever a wrench is needed for tightening. Used to fasten two or more panels, the U-type is slipped over the edge of the first panel and aligned with the hole. Similar to the U-type, the J-type, with one leg shorter than the other, is used wherever full bearing of both legs is not required. Other types are push-on Speed Nuts, tubular-type Speed Clips, self-retaining Speed Clips for the support of cables, Speed Clips for fastening mouldings, and conduit, harness, and ratchet-type Speed Clamps. One of the most outstanding developments in recent years is the Speed Grip Nut Retainer. This type effects tremendous assembly savings in all operations requiring the fastening of square nuts to sheet metal panels. Another recent development is the production of flat-type Speed Nuts in continuous strips. By this method the operator may break the strip from the leading Speed Nut with a clean separation as it is being tightened. The Tinnerman Speed Nut type of fastener is important in the assembly of automobile bodies and radio and television sets, and in the aircraft industry, where its helps to reduce weight.

Tracerlab Inc. (Booth 404). The Tracerlab exhibit will feature a complete line of radioactivity laboratory instruments, including sealers, health survey meters, Geiger tubes, the new Windowless Flow Counter, and the Automatic Sample Changer. There will also be a display of a wide variety of specialized equipment for radioactivity work. Among these will be absorber sets, reference sources, and remote-handling tools. Newly developed crystals for use in scintillation counting will also be available.

U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, Cleveland Regional Office (Booth 324). On display will be publications and services that can be rendered to business through the Department's Office of Technical Services. The U. S. Department of Commerce has long supplied business firms with facts and figures necessary for efficient production and marketing. The Office of Technical Services is a clearinghouse of technological information.

D. Van Nostrand Company, Inc. (Booth 319). A collection of the latest Van Nostrand publications in the fields of chemistry, biochemistry, nuclear science, biology, zoology, and physics will be exhibited. Some of the new titles include: *Chemical Constitution and Biological Activity*, by Sexton; *Water's Organic Chemistry* in the new fourth edition; *Frear's Principles of Agricultural Chemistry*; a new edition of *Perkin and Kipping's Organic Chemistry* in three volumes; *Principles of Nuclear Chemistry*, by Williams; three new books in The Bell Telephone Laboratories Series: *Principles and Applications of Waveguide Transmission*, by Southworth—*Electrons and Holes in Semiconductors*, by Shockley—and *Traveling Wave Guides*, by Pierce. Also featured will be Lindsay's new edition of *Physical Mechanics* and Cork's second edition of *Radioactivity and Nuclear Physics*. There will be a special display of the newly published *Sourcebook on Atomic Energy*, by Glasstone, prepared and written under the direction of the Technical Information Service of the Atomic Energy Commission. A model atomic pile will be exhibited in connection with the *Sourcebook* display.

The Victoreen Instrument Company (Booth 221). The Victoreen display will include all the well-known Victoreen instruments for x-ray therapy, dosage control, personnel protection, health survey and decontamination, quality control, isotope and tracer measurements. Components will include hi-meg vacuum-sealed resistors, Geiger tubes, electrometer tubes, high-voltage regulator tubes, and other subminiature electron tubes. New products will include a new lightweight Geiger counter, model 389, featuring a vibrator power supply; a wide-range count ratemeter, model 524, for isotope measurements; a thimble chamber ratemeter, model 510, calibrated to give instantaneous and continuous reading of gamma and x-ray output in r/min; and a group of standard based 900-v Geiger tubes for a variety of applications.

The Warner & Swasey Co. (Booths 230, 232, 329, and 331). *The Warner & Swasey-Sulzer Weaving Machine:* For the first time since the early days of weaving, a "bobbinless" machine is now available for the weaving of cloth for the American textile industry—the country's third largest. Originally of Swiss design, the Warner & Swasey-Sulzer Weaving Machine was almost completely redesigned to conform with American standards of production. The one feature that most differentiates this new weaving machine from conventional looms is the absence of the bobbin-in-shuttle combination. The filler yarn (known to the trade as woof) is held in a "cheese" at the left side of the machine. Small metal shutters grip the strand of yarn from the "cheese" and pull it at

bullet speed through the yarn, which is fed out of the large cylindrical warp. The filler yarn is cut off after each pass or "pick," so that separate picks in the cloth are not connected with each other. The selvage, which may be either "tucked" or "twisted," is woven by means of special devices. Cloth of higher quality, with fewer imperfections, is produced at definitely higher volume than is possible on the conventional loom.

W. M. Welch Manufacturing Company (Booths 425 and 427). On display will be laboratory instruments including: vacuum pumps, electrical measuring instruments, balances; charts for biology, physiology, organic chemistry, and atomic size ranges; spectrometer; vacuum gauge; new e/m apparatus; teaching models of radio-receiving, radio-transmitting, cathode-ray tube, triode tube; atomic structure models; a new oscilloscope for electrocardiogram analysis.

John Wiley & Sons, Inc. (Booths 106 and 108). John Wiley & Sons, Inc., New York scientific and technical book publishers, will display in Booths 106 and 108 a com-

prehensive collection of recent and standard works in various fields of pure and applied science. Stress will naturally be placed on 1950 books, but Wiley plans to show a full range of titles that have earned recognition as outstanding contributions to their particular field. Many of these will be found in entirely rewritten, revised editions. Among the new books will be titles in the "Biochemical Preparations Series," the "Biological Research Series," Wiley publications in statistics, and recent Methuen Monographs on Biochemical, Biological, and Physical subjects. Wiley's many fields of publication include aeronautics, agriculture, the biological sciences, chemistry, education, the earth sciences, mathematics, mechanical and electrical engineering, public health, physics, psychology, sociology, and business. A display of the Wiley visual aids equipment will also be included in the exhibit. The Wiley representatives in Booths 106 and 108 cordially invite all guests at the convention to stop by their booth, and examine and discuss their entire line of technical publications.

Scientific Book Register

De Re Metallica. Reprint. Georgius Agricola; trans. from the first Latin edition of 1556 by Herbert Clark Hoover and Lou Henry Hoover. New York: Dover, 1950. 638 pp. \$10.00.

The Transmission of Nerve Impulses at Neuroeffector Junctions and Peripheral Synapses. Arturo Rosenblueth. Cambridge, Mass.: Technology Press, M.I.T.; New York: Wiley, 1950. 325 pp. \$6.00.

The Mathematical Theory of Plasticity. R. Hill. New York: Oxford Univ. Press, 1950. 356 pp. \$7.00.

Grundriss zu einer Balneobiologie der Thermen. Vale Vouk. Basle, Switzerland: Verlag Birkhäuser, 1950. 88 pp. Swiss fr. 11.50 bound; 8.50 paper.

Transactions of the International Astronomical Union, Vol. VII. Seventh general assembly held at Zurich, August 11 to August 18, 1948. J. H. Oort, Ed. New York: Cambridge Univ. Press, 1950. 552 pp. \$7.50.

Genes, Plants and People: Essays on Genetics. C. D. Darlington and K. Mather. Philadelphia: Blakiston, 1950. 187 pp. \$4.00.

Pelagic Tunicates of Australia. Harold Thompson. Melbourne, Australia: Commonwealth Council for Scientific and Industrial Research, 1948. 196 pp. and 75 plates.

Seven Science Fiction Novels of H. G. Wells. New York: Dover, 1950. 1,015 pp. \$3.95.

Laboratory Manual for General Botany. Wilson N. Stewart, Harry J. Fuller, and Oswald Tippe. New York: Holt, 1950. 62 pp.; 9 plates. \$1.25.

Chemical Kinetics. Keith J. Laidler. New York: McGraw-Hill, 1950. 408 pp. \$5.50.

Charles Darwin's Autobiography. With an introductory essay by George Gaylord Simpson. New York: Schuman, 1950. 266 pp. \$3.50.

Ionization Chambers and Counters. D. H. Wilkinson. New York: Cambridge Univ. Press, 1950. 266 pp. \$4.50.

Table of the Bessel Functions $Y_0(z)$ and $Y_1(z)$ for Complex Arguments. Prepared by the Computation Laboratory, National Bureau of Standards. New York: Columbia Univ. Press, 1950. 427 pp. \$7.50.

Childhood and Society. Erik H. Erikson. New York: Norton, 1950. 397 pp. \$4.00.

The Location of Critical Points of Analytic and Harmonic Functions. J. L. Walsh. New York: American Mathematical Society, 1950. 384 pp. \$6.00.

Security, Loyalty, and Science. Walter Gellhorn. Ithaca, N. Y.: Cornell Univ. Press, 1950. 300 pp. \$3.00.

Contributions to Mathematical Statistics. R. A. Fisher. New York: Wiley; London: Chapman & Hall, 1950. 43 papers. \$7.50.

The Properties of Asphaltic Bitumen. J. Ph. Pfeiffer, Ed. New York: Elsevier, 1950. 285 pp. \$6.00.

A Laboratory Manual for Geology: Physical Geology, Part I. Kirtley F. Mather, Chalmer J. Roy, and Lincoln R. Thiesmeyer. New York: Appleton-Century-Crofts, 1950. 87 pp. and worksheets. \$2.75.

Methods of Tissue Culture. 2nd ed. Raymond C. Parker. New York: Hoeber, 1950. 294 pp. \$7.50.

Treatise on Powder Metallurgy: Applied and Physical Metallurgy, Vol. II. Claus G. Goetzl. New York: Interscience, 1950. 910 pp. \$18.00.

Functional Anatomy of the Vertebrates. Daniel P. Quiring. New York: McGraw-Hill, 1950. 624 pp. \$5.50.

Theory of the Interior Ballistics of Guns. J. Corner. New York: Wiley; London: Chapman & Hall, 1950. 443 pp. \$8.00.

HOTEL RESERVATIONS

117th AAAS MEETING

Cleveland, December 26-30, 1950

The list of hotels and the reservation coupon below are for your convenience in making your hotel room reservation in Cleveland. Please send your application, *not* to any hotel directly, but to the Housing Bureau of the Cleveland Convention and Visitors' Bureau to avoid delay and confusion. The experienced Housing Bureau will make assignments promptly and the hotel will send a confirmation directly to you in two weeks or less. **Please plan to share a room with a colleague.** In addition to economy, this will insure ample accommodations for all in the *downtown* hotels. Mail your application *now* to secure your first choice of desired accommodations.

HOTELS AND RATES PER DAY

Hotel*	Single	Double	Twin-Bedded	Suites
STATLER	\$4.00-\$8.00	\$7.00-\$10.00	\$8.50-\$12.50	\$17.00-\$23.00
HOLLENDEN	\$3.50-\$8.00	\$5.50-\$10.00	\$7.00-\$12.00	\$12.00-\$22.00
CARTER	\$4.00-\$6.50	\$6.00-\$10.00	\$7.00-\$10.00	\$18.00-\$25.00
ALLERTON	\$3.50-\$7.00 \$2.50 RW	\$6.00-\$ 9.00	\$6.00-\$10.00 \$4.00 RW	\$10.00-\$20.00
AUDITORIUM	\$3.50-\$5.00	\$5.50-\$ 7.50	\$7.50	\$12.50-\$26.00
OLMSTED	\$3.00-\$6.00	\$5.00-\$ 9.50	\$7.00-\$ 9.50	\$10.00-\$15.00

Prices are subject to change, but are not likely to do so.

RW means running water only—no private bath.

* A list of the headquarters of each society and section is under **Association Affairs, SCIENCE**, August 25 and in **THE SCIENTIFIC MONTHLY** for September.

THIS IS YOUR HOTEL RESERVATION COUPON

Mrs. Louise D. Perkins, Director
Housing Bureau
Cleveland Convention and Visitors' Bureau, Inc.
511 Terminal Tower
Cleveland 13, Ohio

Date of Application

Please reserve the following accommodations for the 117th Annual Meeting of the AAAS:

TYPE OF ACCOMMODATION DESIRED

Twin-Bedded..... Rate.....
Suite..... Rate..... Number in Party.....
Double Room..... Rate.....
Single Room..... Rate..... Sharing this room will be:

persons.
(Enumerate and attach list giving name and address of each person, including yourself)

CHOICE OF HOTEL

First Choice..... Second Choice..... Third Choice.....

DATE OF ARRIVAL..... DEPARTURE DATE.....

(These must be indicated)

SIGNED

(Please print or type)

ADDRESS

(Street)

(City and Zone)

(State)

Mail this now to the Housing Bureau.

Rooms will be assigned and confirmed in order of receipt of reservation.

Hotels will confirm directly in two weeks or less.

News and Notes

New England Intercollegiate Field Geology Trip

Lloyd W. Fisher

Department of Geology, Bates College, Lewiston, Maine

The 42nd annual New England Intercollegiate field geology trip was held on October 14 and 15 in the Bucksport-Orland and Mount Desert Island, Maine, area. Joseph Trefethen, of the University of Maine, and Erwin Raisz, of the Institute of Geographic Exploration, Harvard University, were trip leaders. In attendance were 118 geologists, representing 19 colleges and universities, the U. S. Geological Survey, and the Canadian Geological Survey.

Dr. Trefethen conducted the "hard" rock trip to various localities within the Bucksport and Orland quadrangles, to illustrate exposures of early Paleozoic rocks of metamorphic and sedimentary types and later granites of two groups with associated igneous types. Trefethen has established the following stratigraphic sequence in his mapping of the area: The Penobscot formation (Bastin), consisting of metamorphosed equivalents of fine-grained sandstones, siltstones, and shales; the Bucksport formation of lime-silicate gneiss and hornfels; the Cope-land formation, which includes thin-bedded muscovite schist and quartzite, and grades downward through a migmatitic facies; the Knox gneiss, which includes igneous and metamorphic gneisses and schists. On the basis of the date established by Bastin for the Penobscot formation, Trefethen believes that the sediments are of Devonian or earlier Paleozoic age.

Outcroppings of the various formations were studied in a systematic manner in order to show that the central structure of the region is anticlinal, with the Knox gneiss at the core of the antiline. Steepening of the fold axes at margins of the Mount Waldo batholith indicates that the batholith may have lifted its lid during intrusion.

Intrusive rocks studied were the medium-textured biotite gneissic granite—Winterport type—the Mount Waldo and Lucerne granites, and basic dikes. The Lucerne

granite underlies much of the Orland quadrangle and is similar to, but coarser than, the Mount Waldo granite.

Dr. Raisz conducted a group interested in geomorphology to Mount Desert Island. He pointed out the glacial features and the associated shore-line features of the granitic mountains of the area. These granitic mountains (Mount Cadillac and others) stood athwart the direction of movement of the southerly advancing continental ice as it moved across the rolling peneplane of southern Maine. Ice tongues originated as the ice grew higher and spilled through preglacial saddles in the granite masses and sawed its way downward, leaving nine evenly spaced, north-south trending glacial troughs or "dorrs." Raisz likened these dorrs to those of the Mount Holyoke range and of the Blue Hills, in Massachusetts. Somes Sound, invaded by the postglacial sea, is one of the central dorrs formed by southward-moving ice, and represents a fiord or a submerged glacial trough.

Evidence noted in two delta deposits and on promontories washed clean of glacial gravel suggest that the upper marine limit of the postglacial sea was 230 feet. Postglacial wave attack has cliffed some of the older and more brittle rocks, the felsites, and cut some evenly spaced thunderholes in other rocks, but most of the natural seawalls seem to be the result of glacial plucking. Dr. Raisz indicated that there are many unsolved problems in the area—viz., the general southward downtilt of Maine in postglacial time; the sharp, glaciated notches at Seal Cove Pond; and the "tundras," bog-filled marsh deposits.

The usual business meeting was conducted at the University of Maine on Saturday evening, and refreshments were served by the host-leader and Mrs. Trefethen. No "spot" has been selected for the 1951 meeting, which will mark the 50th anniversary of the organization.

Scientists in the News

Recent visitors at the National Bureau of Standards from abroad were: **Morris Bailey**, Australian Research Association on Leather, Sydney; **E. S. Hedges**, and **W. R. Lewis**, Tin Research Institute, London; **Albert Mathieu**, Parra Mantois Le Vesinet, Slo, France; **L. Van Ouwkerk**, Roentgen Technical Services, Inc., Overachie, Holland; **A. Swagerman**, G. Dijkers & Co., Hengelo, Holland; and **Lee O. Stern** and **W. R. Marchant**, Sociedad Fraternal Huteriana, Primavera, Alto, Paraguay.

William J. Cromartie, of the University of Minnesota, and **Henry P. Treffers**, of Yale, have been appointed to the ONR Advisory Panel for Microbiology. Other members include Walter J. Nungester, University of Michigan; H. O. Halvorson, University of Illinois; Charles A. Evans, University of Washington; and J. Roger Porter, University of Iowa.

The newly elected chairman of the American Chemical Society's Division of Biological Chemistry is **John T. Edsall**, associate professor of biochemistry and chairman of the board

of tutors in biochemical sciences at Harvard Medical school. He succeeds **Max A. Lauffer** of the University of Pittsburgh. **R. H. Barnes**, director of biochemical research of Sharp & Dohme, Inc., was named vice chairman, and **P. W. Preisler**, Washington University of School of Medicine, secretary-treasurer.

Heinz Fraenkel-Conrat, senior chemist of the USDA Western Regional Research Laboratory, has resigned to spend a year abroad at the National Institute of Medical Research, Mill Hill, London, and the Carlsberg Laboratories in Copen-

hagen before joining the staff of the Virus Laboratory of the University of California.

The developer of one of the first successful radar homing devices, **Charles D. Perrine, Jr.**, has joined the electronics and guidance section of Consolidated Vultee, San Diego. Perrine went to Convair from his position as manager of the electronics department of Fairchild Engine and Airplane Corporation's guided missiles division, Farmingdale, N. Y. Prior to this he was associated with the Hughes Aircraft Company, Los Angeles, where he designed and built the radio equipment for the plane in which Howard Hughes made his around-the-world flight in 1938, at that time a record-breaking 91-hour trip.

T. M. Sugden has been named H. O. Jones Lecturer in Physical Chemistry at Cambridge University. Dr. Sugden succeeds **F. S. Dainton**, who is now professor of inorganic and physical chemistry at the University of Leeds.

The origin and development of island life in the Pacific was the subject of a series of 13 lectures recently given by **Elwood C. Zimmerman**, at Stockholm, Uppsala, Lund, and Copenhagen. He has since returned to his research at the British Museum of Natural History, where he has been preparing further volumes of his series on "Insects of Hawaii" since June 1949. Dr. Zimmerman plans to return to his post at the Experiment Station, Hawaiian Sugar Planters' Association, Honolulu, next summer.

Awards

The Progress Medal of the Society of Motion Picture and Television Engineers has been presented to **Vladimir K. Zworykin**, vice president of RCA Laboratories Division. This is the highest distinction conferred by the society on an individual for significant contributions in a new field. Other major awards were the **Samuel L. Warner Award Medal**, to **Charles R. Fordyce**, superintendent of the Department of Manufacturing Experiments, Eastman Kodak Company, for research

and development leading to wide commercial adoption of safety film, and the **Journal Award**, to **Frederick J. Kolb, Jr.**, of Eastman Kodak Company, for his technical paper, "Air Cooling of Motion Picture Film for Higher Screen Illumination," judged the best published in the society's journal during 1949.

At the annual meeting of the Mineralogical Society of America, the **Roebbling Medal** was awarded to **Norman L. Bowen**, of the Geophysical Laboratory, Washington, D. C. This medal is the highest award offered by American mineralogists for significant contributions in their field.

Fellowships

Two fellowships in basic sciences in medicine are being offered by the College of Medicine of the State University of Iowa for 1951-52 to graduates who plan academic careers in medicine. The fellowships are on the basis of half-time teaching and half-time research in anatomy, bacteriology, biochemistry, pathology, pharmacology, physiology, and hygiene and public health, including parasitology, and are open to graduates of any approved medical school. The stipend is \$3,600 a year for single fellows and \$4,000 for those who are married. Application forms may be obtained from the Office of the Dean, College of Medicine, State University of Iowa, Iowa City, and must be returned by April 1.

The Social Science Research Council is offering fellowships and grants of the following types for 1951: Research Training fellowships, open to men and women who have demonstrated exceptional aptitudes for research and who wish to obtain more advanced research training than is provided in the usual Ph.D. program. Normally, support will be given for one year, and the basic stipends are \$2,500 for predoctoral, and \$3,500 for postdoctoral, fellows; Grants-in-Aid of Research with a stipend not to exceed \$1,500; Area Research Training Fellowships offered for advanced training in preparation for research clearly related to understanding of the contemporary culture of a major world area outside

the U. S. Preference will be given for work in the social sciences, and stipends are \$2,500 per year for predoctoral, and \$3,500 for postdoctoral, fellows. Travel Grants for Area Research, not to exceed \$2,500, are offered only to mature scholars of established competence as specialists on the contemporary culture of a major world area outside the U. S.; Faculty Research Fellowships are open to members of social science faculties under 35 to enable them to devote time to self-directed research. Inquiries, which should indicate age, academic status, vocational aims, the nature of proposed training or research and type of assistance desired, should be addressed to the Washington office of the Social Science Research Council, 726 Jackson Pl., N. W., Washington 6, D. C. Applications must be filed by January 15.

Nominations for the **Elmer Peter Kohler Fellowship**, which provides for exchange of outstanding students between Harvard University and other schools, are now being accepted for 1951-52. The fellowship carries a stipend of \$1,000. A fellow appointed for study at Harvard will be recommended for a tuition fellowship and will receive a subsidy from the Harvard Foundation for Advanced Study and Research for about 80% of his research expenses. Nominations of candidates, with application for admission to the proposed institute of study, should be sent to **W. S. Johnson**, Department of Chemistry, Harvard University, Cambridge 38, by February 1.

Colleges and Universities

Western Reserve University will present two topics in the Frontiers in Chemistry Lecture Series for 1951: "Application of Instruments to Composition and Molecular Structure" and "Prevention of Deterioration of Organic Materials." Each topic will be covered in five lectures on successive Fridays, starting March 2. Lecturers and their subjects will be announced later.

Lincoln University (Pennsylvania) has established America's first Institute for the Study of African Affairs, similar in organization to the Russian institutes at Harvard

and Columbia. The staff will include experts on African history, economics, politics, art, religion, and languages. The three purposes set forth for the institute are: to provide African students in the U. S. opportunities for seeing problems of their continent in perspective and to aid them in planning for careers of service in their native land; to enlighten Americans who will "increasingly play important roles in African affairs;" and to help build a world united through mutual understanding.

Stevens Institute of Technology has acquired an analog computer, lent by the Office of Naval Research. The acquisition of this experimental model makes Stevens one of the first engineering schools to have such a device. Housed in the Navy Building on the campus, the machine will be used for research computations by the Experimental Towing Tank and other research operations, and for instruction in a graduate course in computing devices.

Meetings

The Radiological Society of North America will hold its annual meeting December 10-15, at the Palmer House, Chicago. A series of refresher courses will be presented: two on Sunday and seven courses daily thereafter. Nonmembers will be charged a fee for attendance. Scientific and commercial exhibits will be shown. The Carman Lecture will be given by Warren W. Furey, president of the society.

The Harvey Society has announced the speakers for its annual series of lectures, given at the New York Academy of Medicine. William T. Astbury, University of Leeds, England, Boris Ephrussi, Laboratoire de Génétique, University of Paris, and Andre Courmand, College of Physicians and Surgeons, Columbia University, gave the first three lectures of the series. The future schedule includes:

Dec. 21—"Some Chemical Aspects of the Cell Nucleus," Alfred E. Mirsky, The Rockefeller Institute for Medical Research;

Jan. 18—"The Problem of Fertilization as Elucidated by Experiments on Sea Urchins," John Run-

ström, director of the Wenner-Gren Institute for Experimental Biology, Stockholm;

Feb. 15—"Enzyme Studies in Biological Oxidations and Synthesis," Severo Ochoa, New York University College of Medicine;

Mar. 15—"Present Knowledge of Growth and Adrenocorticotrophic Hormones," Choh Hao Li, University of California at Berkeley;

April 19—"The Path of Carbon in Photosynthesis," Melvin Calvin, Radiation Laboratory, University of California at Berkeley; and

May 17—"Immunochemistry of the Blood Group Substances," Elvin A. Kabat, College of Physicians and Surgeons, Columbia University.

The annual meetings of the **American Association of Economic Entomologists** and the **Entomological Society of America** will be held in Denver, December 18-21, at the Cosmopolitan and the Shirley-Savoy Hotels. The AAEE program includes a special session on the bioassay of insecticides and a joint session with the Entomological Society. The ESA program features a symposium on morphology and evolution, and the Invitational Public Address will be given by Cornelius B. Philip, Rocky Mountain Laboratory, USPHS, Hamilton, Mont.

The 34th annual meeting of the **Mathematical Association of America** will be held at the University of Florida, on December 30. Speakers will be A. W. Tucker, Princeton University; A. S. Householder, Oak Ridge National Laboratory; J. F. Daly, Bureau of the Census; E. J. McShane, University of Virginia; L. M. Kelly, Michigan State College; and Tomlinson Fort, University of Georgia.

The 11th annual **Congress of Industrial Health** will be held in Atlanta, Ga., at the Atlanta Biltmore Hotel, February 26-27. The congress will be sponsored by the Council on Industrial Health of the American Medical Association, the Medical Association of Georgia, the Fulton County Medical Society of Atlanta, and the DeKalb County Medical Society of Decatur. The importance of industrial health in civil defense in times of national disaster will be highlighted.

New Delhi, India, will be the scene of the second postwar sectional meeting of the **World Power Confer-**

ences January 10-15. The **fourth Congress on Large Dams** is to be held at the same place and time. Before and after the two conferences study tours will be conducted from the Malikpore hydraulic research station in the extreme north of India to Bangalore, Mysore, and the Mettur Dam in the south. Closing sessions will take place at Mysore on February 1. Concurrently an **Indian International Engineering Exhibition** will be held at New Delhi.

NRC News

National Research Fellowships in the Natural Sciences and Merck Postdoctoral Fellowships will be continued for the academic year 1951-52, and applications are now being accepted. The NR Fellowships, supported by the Rockefeller Foundation to promote fundamental research in the natural sciences, are available in mathematics, astronomy, physics, chemistry, geology, geophysics, paleontology, physical geography, botany, zoology, biochemistry, biophysics, agriculture, forestry, anthropology, and psychology. They are awarded to citizens of the U. S. or Canada, and generally only to persons under 35 years of age. The requirements for the doctorate must have been completed prior to assuming the fellowship, and the fellow must have demonstrated a high order of ability in research. Fellowships will be awarded by the Natural Sciences Fellowship Board at its meeting in March 1951. Applications to be considered at this meeting should be filed on or before *January 1, 1951*. Tenure of the fellowship may begin at any appropriate time after the Board meeting.

The Merck Postdoctoral Fellowships, supported by Merck & Company, Inc., are designed to give special training and experience to young men and women who have demonstrated marked ability in research in chemical or biological sciences, and who wish to broaden their fields of investigation. They are open to citizens of the U. S. with training in chemistry or biology equivalent to that represented by the Ph.D. degree. All fields of chemistry or biology, including the preclinical medical sciences, are open to these applicants,

and the fellowship board will give special consideration to applicants who wish to supplement their specialty with work in another field. Applications must be filed before *January 15, 1951*. Awards will be made as soon as possible after March 1, and, unless otherwise arranged, tenure will begin on July 1. Appointments will be made for one year; in exceptional cases applications for renewal will be considered.

Application blanks and further information may be obtained from the Fellowship Office, National Research Council, 2101 Constitution Ave., N.W., Washington 25, D. C.

The proceedings of a **Conference on Absolute Beta Counting** have been published as Preliminary Report No. 8 in the NRC "Nuclear Science Series;" the report is available from the Division of Mathematical and Physical Sciences upon request from active workers in the field. The conference was convened by the NRC Committee on Nuclear Science to discuss problems involved in the determination of disintegration rates by counting β -rays. The eleven papers presented at the meeting considered such problems as the standardization and use of radium isotopes as β -sources, the construction and mounting of β -counters, and back-scattering and absorption phenomena. Comments and discussion are included for each paper.

The little-known **fauna of South Africa's highlands** will be thoroughly studied during a 10-month period by Per Brinck and Gustav Rudebeck and their wives, all of the Institute of Zoology, Lund, Sweden. The latest ecological methods will be employed, and it is hoped that remnants of an antaretic animal world will be found. The investigations will be carried out in collaboration with South African scientists; later much of the material will be studied in Swedish museums.

The second annual **Radiation Instrument Catalog**, compiled and edited by the AEC Radiation Instruments Branch, is available at \$2.00 a copy from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

According to the publication, 84 U. S. firms are engaged in the manufacture of 180 different types of radiation detection instruments and their components and accessories. The catalogue lists 543 specific items of equipment now commercially available.

The American Physical Society has organized a division of chemical physics to advance understanding in subjects of chemical interest the development of which depends on modern physical theories or techniques. Members of the society may send application for membership in the division, with an initiation fee of \$2.00, to R. S. Mulliken, Physics Department, University of Chicago. The inaugural meeting of the division will be held at the society's Pittsburgh meeting, March 8-10, 1951. It will comprise a symposium on molecular structure and valence theory and symposia illustrating the application of statistical and quantum mechanics.

As part of the continuing investigation of allergy, 38 U. S. and Canadian doctors have completed an **allergy map** of these countries, locating the areas of heavy mold spore concentrations. Leonard H. Harris, of Northwestern University, headed the committee of the American Academy of Allergy in its survey of airborne mold spores. The investigators found two molds, *Alternaria* and *Hormodendrum*, in greatest abundance in the Great Plains area of the U. S., less in the Eastern states, and least in the South and Southwest. It was found that these molds grow in great profusion on wheat, oats, hay, and corn. The survey will aid allergists in identifying and classifying mold colonies and their spores and will add information concerning the relationship between various species.

The Sarawak Museum, Kuching, Sarawak, is interested in arranging exchanges of specimens and publications. The museum has extensive ethnographical collections, including an outstanding one in Borneo material. It has considerable archaeological material, including neolithic implements, about 15,000 bird skins,

1,000 mammals, a rich collection of insects, a representative collection of mollusks, and collections of fish, reptiles, and other groups. An extensive plant collection has recently been rearranged by the director of the Botanic Gardens, Singapore. These collections come, for the most part, from Sarawak, but include material from North and East Borneo.

The recently revived *Sarawak Museum Journal* is published as opportunity permits, with at least one issue a year (two issues in 1950). The editors plan to devote a large proportion of space in the immediate future to anthropology, ethnology, and archaeology, but zoological, botanical, meteorological, and geological contributions will be published. The subscription price is approximately \$2.50.

"Hilholme," one of the estates of the late Percy S. Straus, has been sold by the U. S. Public Health Service for approximately \$140,000. The proceeds will be used in a five-year program of **research in multiple sclerosis**. The purchaser of the property is now operating it as a home for the custodial care of patients with multiple sclerosis and other chronic neurological diseases.

Publications Received

ACTH. The Armour Laboratories, 1425 W. 42nd St., Chicago 9, Ill.

Human Sterilization: Techniques of Permanent Conception Control. R. L. Dickinson and C. J. Gamble. Birthright, Inc., Sterilization for Human Betterment, 134 Nassau St., Princeton, N. J.

The British Journal for the Philosophy of Science, Vol. I, No. 1. Thomas Nelson and Sons, Ltd., Parkside Works, Edinburgh, Scotland. 7/6.

Proceedings of Symposium on Improved Quality Electronic Components. Trielectro Company, 1 Thomas Circle, Washington 5, D. C. \$3.50.

The Snellius Expedition in Eastern Part of East Indian Archipelago, 1929-30. Vol. II, Oceanographic Results; Part 6, Tables, Serial and Bottom Observations, Temperature, Salinity and Density. P. M. Van Riel et al. E. J. Brill, Oude Rijn 33a, Leiden, Holland.

3 OF THE MORE THAN 3300 EASTMAN ORGANIC CHEMICALS

The professor left . . .



2-Acetylaminofluorene (Eastman 4665) has had an upsurge of demand for the past few months, and we're not quite sure why. We do know that it's a carcinogenic compound and that more and more people are getting into the good fight against that most dread of man's enemies—cancer. When 2-acetylaminofluorene first appeared in the Eastman list a number of years ago, it was synthesized for us by a professor at a New York State college, but now that he has left academic life for industry and the demand for his product has risen, we are making it in our own laboratories.

"Ready-mix" pH indicators . . .

Sodium salts of sulfonphthalein pH indicators save time around the laboratory because they can be dissolved directly in water without trituration with alkali. That's why we've recently selected five highly useful indicators with sharp end-points and added their sodium salts to the Eastman list. They are: Bromthymol Blue Sodium Salt (Eastman 6127); Bromcresol Purple Sodium Salt (Eastman 6266); Cresol Red Sodium Salt (Eastman 6254); Phenol Red Sodium Salt (Eastman 6131); and Bromphenol

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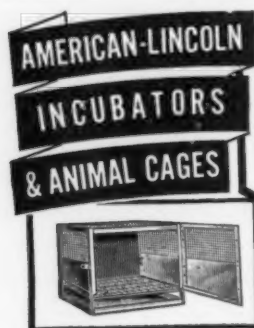
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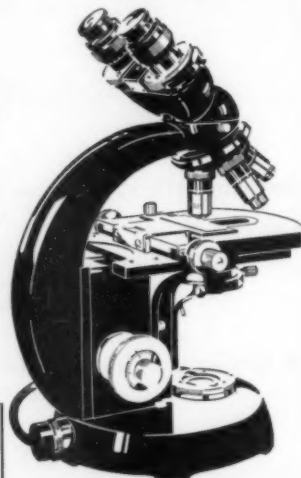
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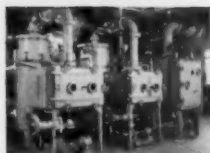
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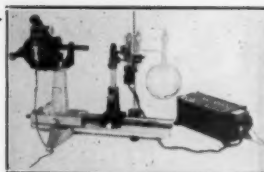
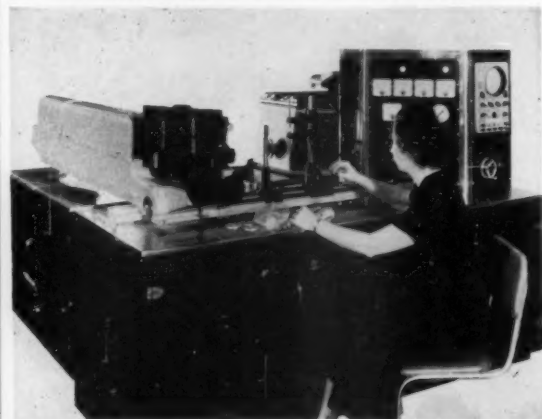
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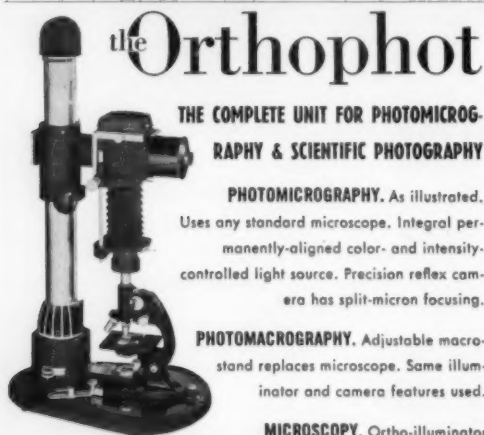
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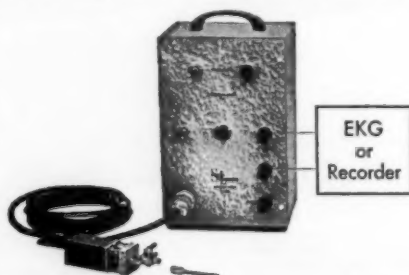
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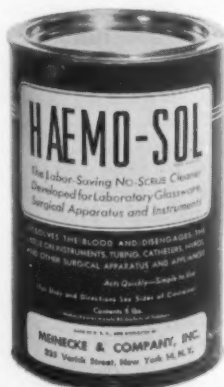
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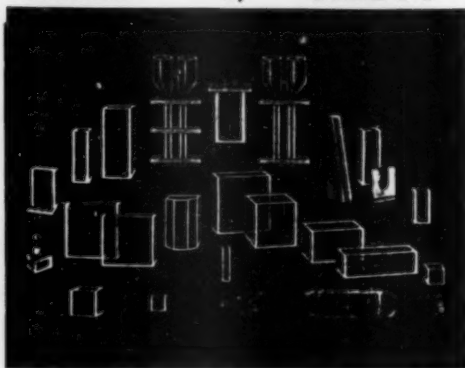
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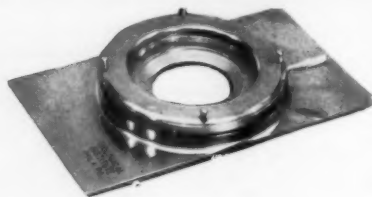
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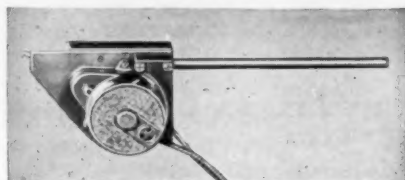
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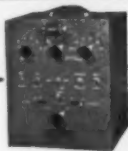
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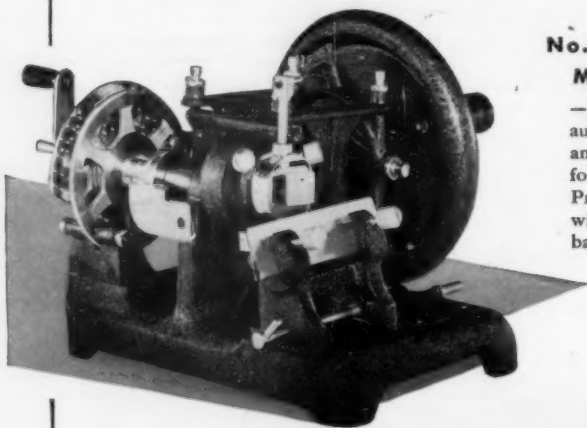


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